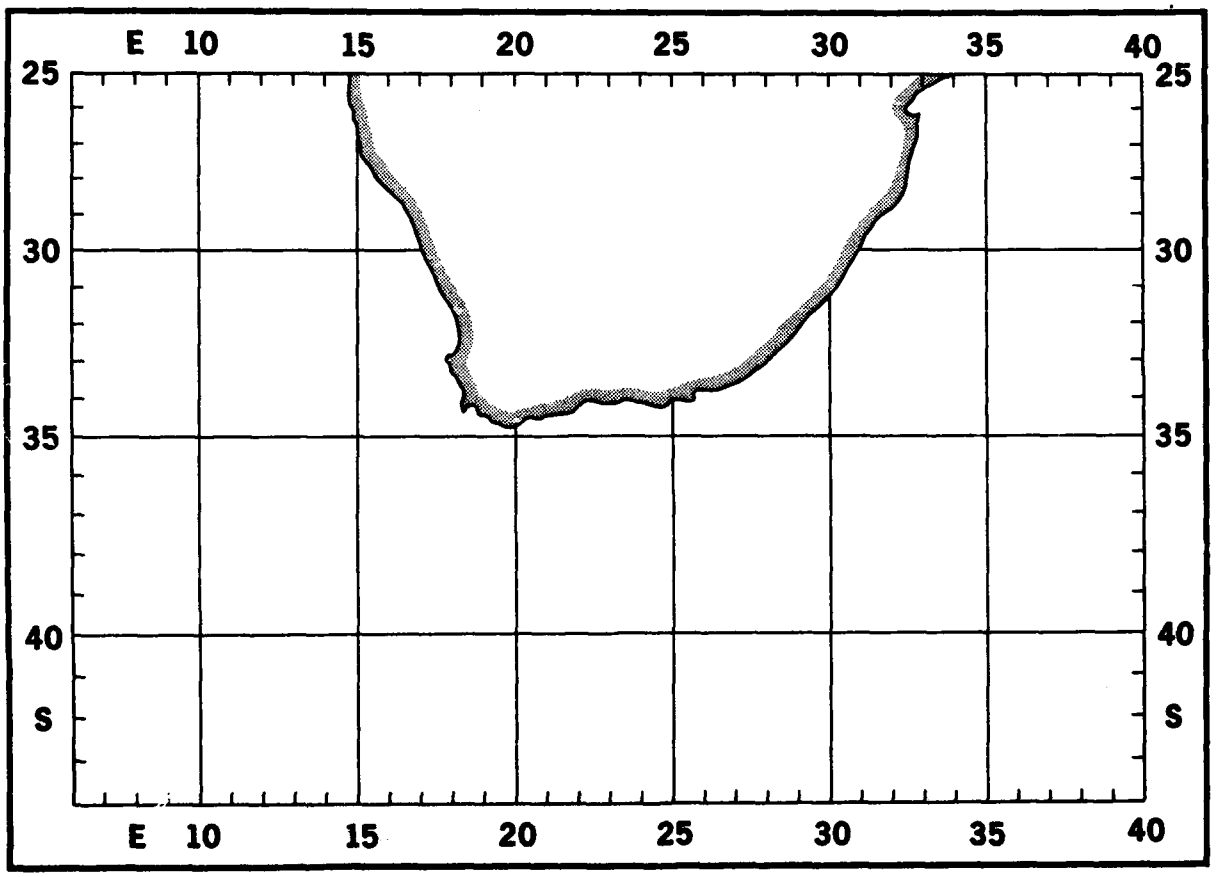
NAVAIR 50-1C-548

U.S. NAVY REGIONAL CLIMATIC STUDY OF SOUTHERN AFRICAN WATERS

MARCH 1989



PREPARED BY
NAVAL OCEANOGRAPHY COMMAND DETACHMENT,
ASHEVILLE, N.C.

PREPARED UNDER THE AUTHORITY OF
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STENNIS SPACE CENTER, MS 39529-5000

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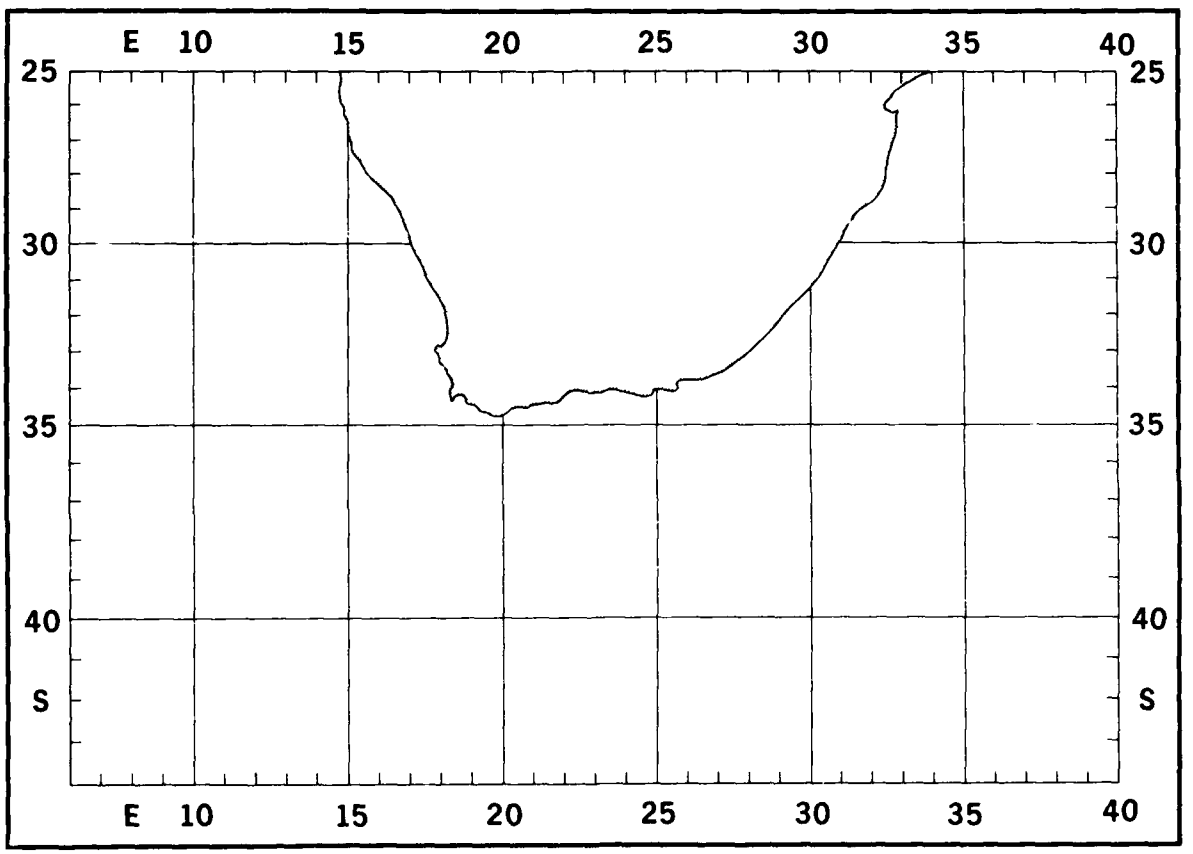

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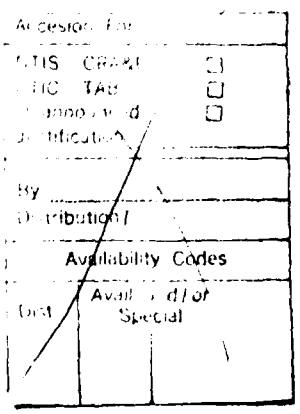
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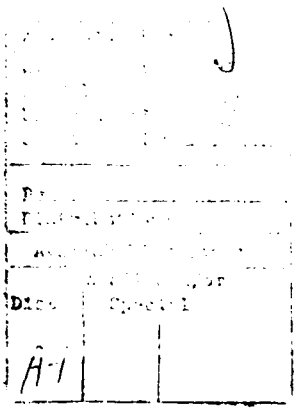

U.S. Navy Regional Climatic Study of Southern African Waters

The U.S. Navy Regional Climatic Study of the Southern African Waters was prepared by the Officer in Charge, Naval Oceanography Command Detachment, Asheville, North Carolina, under authority of Commander, Naval Oceanography Command. The work was performed at the National Climatic Data Center (NCDC). Specific acknowledgement of the NCDC staff is made to Mr. J. D. Elms, project leader; Mr. P. M. Steurer, for his data analysis; Messrs C. N. Williams, Jr., R. G. Baldwin and Ms. P. L. Franks for data processing and digital graphics; Mr. M. J. Changery and Dr. W. J. Koss for technical review; and Messrs M. G. Burgin and S. J. Miller for their drafting skills.

Geographical and Data Coverage

This study, entitled the U.S. Navy Regional Climatic Study of the Southern African Waters, is for the region which comprises the waters around southern Africa from 25°S to 44°S and 6°E to 40°E. The selected limits allow for a small overlap between this region and that of the study for the Mozambique Channel, (NAVAIR 50-1C-549). Most emphasis in this study was placed on the marine areas, with only a few coastal station summaries included in the text and final section of this publication. Figure 1 outlines the study area and shows the location of the land station summaries and bathymetry information.

Surface marine observation statistics are presented on monthly charts in the forms of graphs, tables and isopleth maps. Land station data appear graphically and in Station Climatic Summary tables. The marine data (mostly from ships of opportunity) were summarized and machine plotted by one-degree quadrangle. The graphs and tables for the marine areas are also presented by one-degree quadrangles (for visibility, wave heights, wind roses and ocean currents). The geographical area for the tables, ocean currents, and wind roses had to be divided and presented on four pages for clarity. However, the two poleward charts covering visibilities, wave heights, and ocean currents were not included in this publication. After reviewing, the charts showed that too few observations were present for representative statistics. These graphs and tables represent the objective compilation of available ship data; the data were not adjusted for suspected bias (low observation count, heavy weighting of observations during a short time interval, biases in coding, etc.), and differences may be found when comparing the graphical data with isopleth analyses. The total number of observations for a given one-degree square should always be considered when interpreting the data, as there may be an insufficient number to permit representative statistics.

Approximately a million and a quarter surface marine observations were used in computing the statistics. These data were collected by ships of various registry traveling in the area. Many of the ship's observations are presently transmitted over the Global Telecommunications System, captured and archived. However, many are digitized from ship log forms by various participating members of the World Meteorological Organization, and exchanged under international agreement among the various maritime nations of the world. Data for this study date back to 1854 and run through 1984. The bulk of the observations are from the last 30 years, which is significant because more recent observations contain more elements than pre-1948 reports. The density of observations is greatest along the major shipping routes which, in this area, run around the Cape of Good Hope. There the overwhelming majority of the observations lie within 3 degrees of latitude of the south coast of Africa and fan out from the east and west coasts.

The mean sea current charts were obtained from available ship's "set and drift" measurements that had been forwarded to the Naval Oceanographic Office from ships of various registry. The data were summarized to give the primary and secondary current directions and mean speeds.

Physical Features

The study area lies just south of the Tropic of Capricorn. It covers the southern tip of Africa, which includes most of the Republic of South Africa, and the lower portions of Southwest Africa (Namibia), Botswana and Mozambique. Along the west coast lies the Atlantic Ocean and on the east coast the Indian Ocean. These two important oceans merge along the south coastal region.

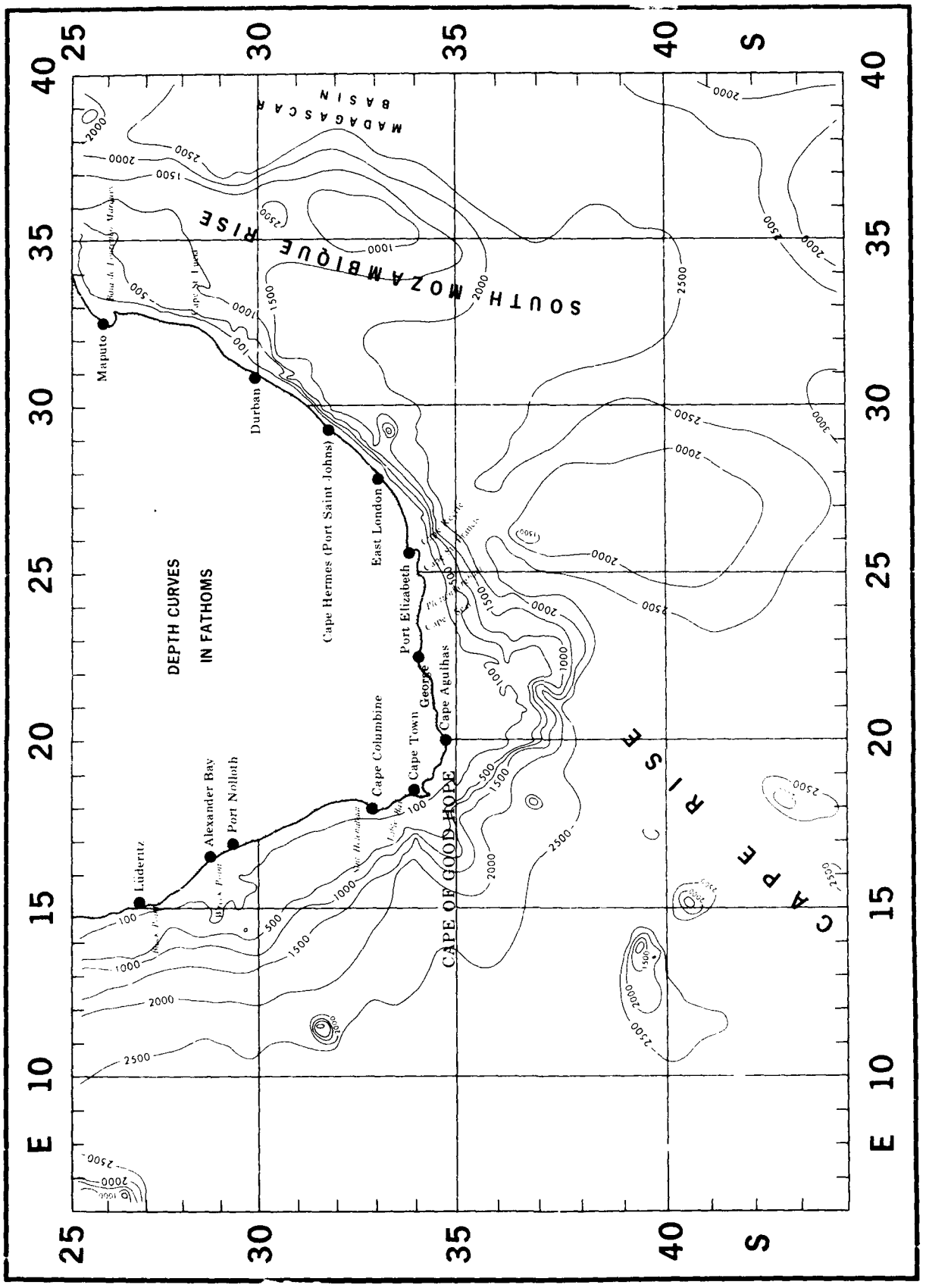

FIGURE 1. Study Area Locator Map and Bathymetry Chart

A narrow coastal belt rings southern Africa with a vast plateau comprising the interior region. A relatively steep escarpment, generally rising above 4500 feet, separates the coast and the plateau in most sections. There are numerous rivers around the perimeter of southern Africa which flow from the edge of the plateau down the escarpment into the ocean. However, these are all practically useless for either irrigation or for navigation. The major river system is the Orange River which flows westward some 1200 miles before reaching the Atlantic Ocean. It drains about 400,000 square miles of the South African Plateau region. The western part of its basin is so prone to dry conditions and the feeder tributaries are so seasonal that occasionally the flow does not reach the mouth of the river during the dry season. The only other principal river system is the Limpopo which flows through southern Mozambique into the Indian Ocean.

Because of the cold Benguela current and upwelling off the southwest African coast, little precipitation occurs in that region. The Namib Desert along the coast and the Kalahari Desert across the western plateau are a result of the lack of precipitation.

Mountain ranges are found along the rim of the escarpment. The Drakensberg Mountains in the southeast are the most distinctive and have the highest peak, Thabana Ntlenyana, at 11,425 feet. In the Cape region a number of smaller mountain ranges, known as the Cape Ranges, are found; they are named the Swartberg Mountains, Outeniqua Mountains, Nuweveld Range, and Roggeveld. The Roggeveld has the highest peak, Compass Berg, at 8215 feet. Along the west coast a number of relatively low mountains are also found along the escarpment, with most peaks within the study area below 7000 feet. The highest peak, Karas Mountain at 7224 feet, is located to the northeast of Alexander Bay. Figure 2 gives a generalized view of the regional topography.

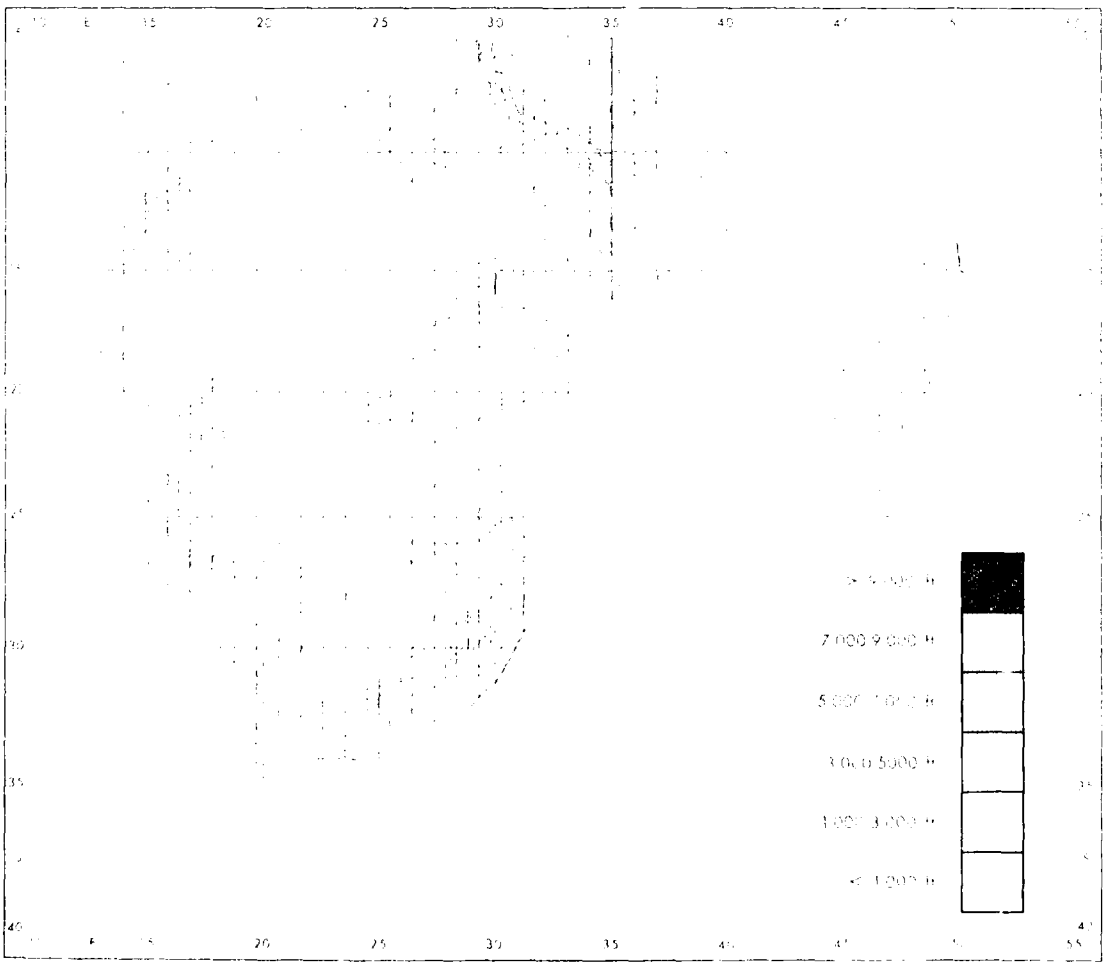

FIGURE 2. Topographic Chart

The cool Benguela current flows from south to north off the west coast of southern Africa. Most of the coolness is derived from local subsurface water upwelling, rather than from the transport of cooler waters by the southern ocean current from the Antarctic region. Along the east coast is the southward flowing current which is known as the Mozambique current in and just south of the Mozambique Channel, and the Agulhas current along most of the southeast coast of South Africa. The Agulhas current is also somewhat strengthened by the South Equatorial current which flows just south of the southern edge of Madagascar. See Figure 3 for a pictorial of the regional ocean currents.

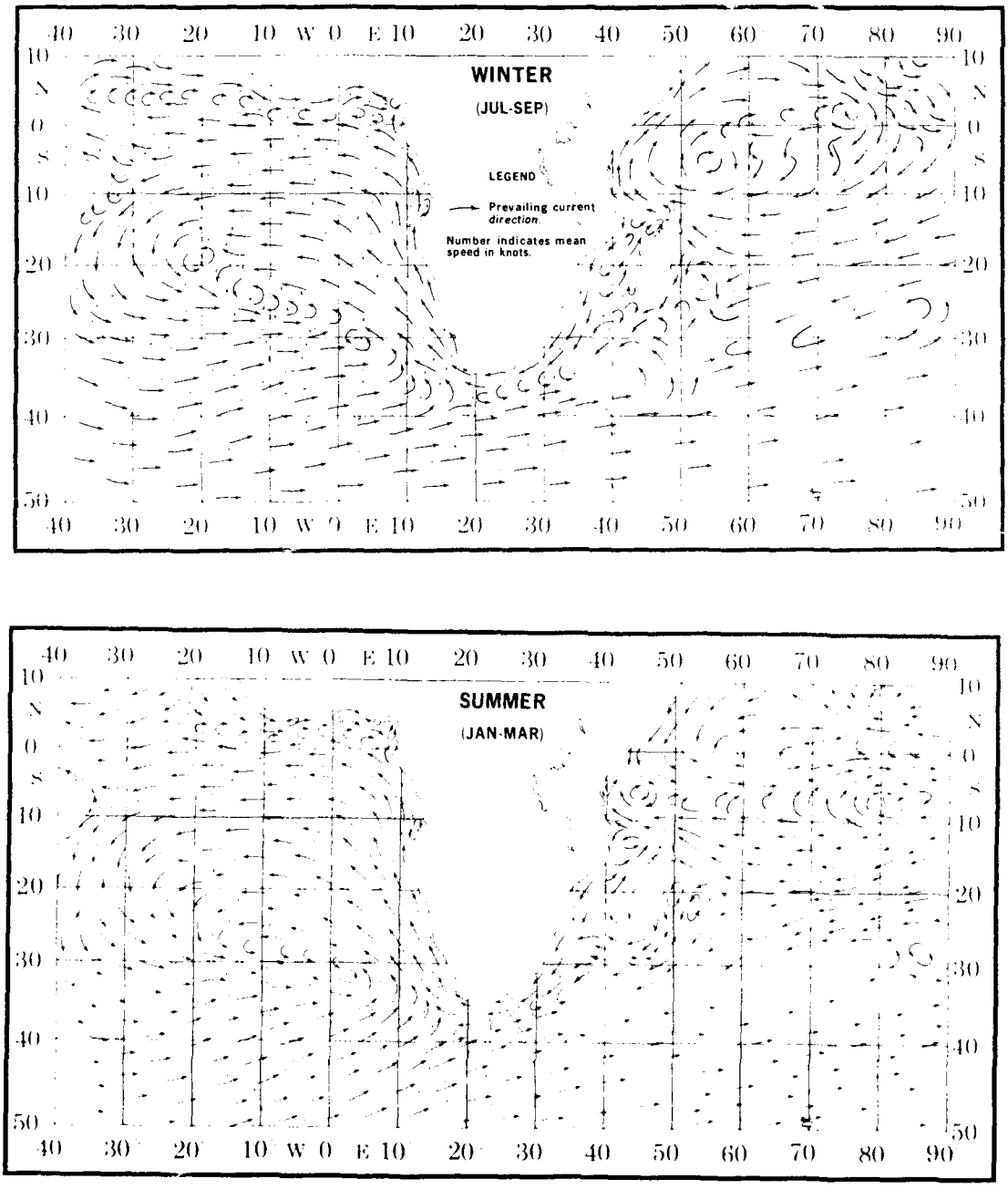

FIGURE 3. Surface Currents (winter and summer)

Waves, known as rollers, come from a distant source (swells) and form large breaker waves on exposed coasts. These are best known on the islands of St. Helena and Ascension in the South Atlantic Ocean, but they also effect the southern coasts of Africa. Sometimes unusually high swells, estimated to be as high as 70 feet, have affected the South African Coast. They are known as Cape Rollers. Those freak waves have been known to do catastrophic damage to ships. The southeastern coast of Africa has the necessary physical feature which, under certain synoptic meteorological conditions, produces those rare high waves: a narrow continental shelf with a steep bathymetric gradient. When unimpeded swells from the open waters to the south encounter the swift Agulhas current which runs southward parallel to the continental shelf, Cape Rollers of enormous size can develop with the potential for destructive damage to any ship within their paths.

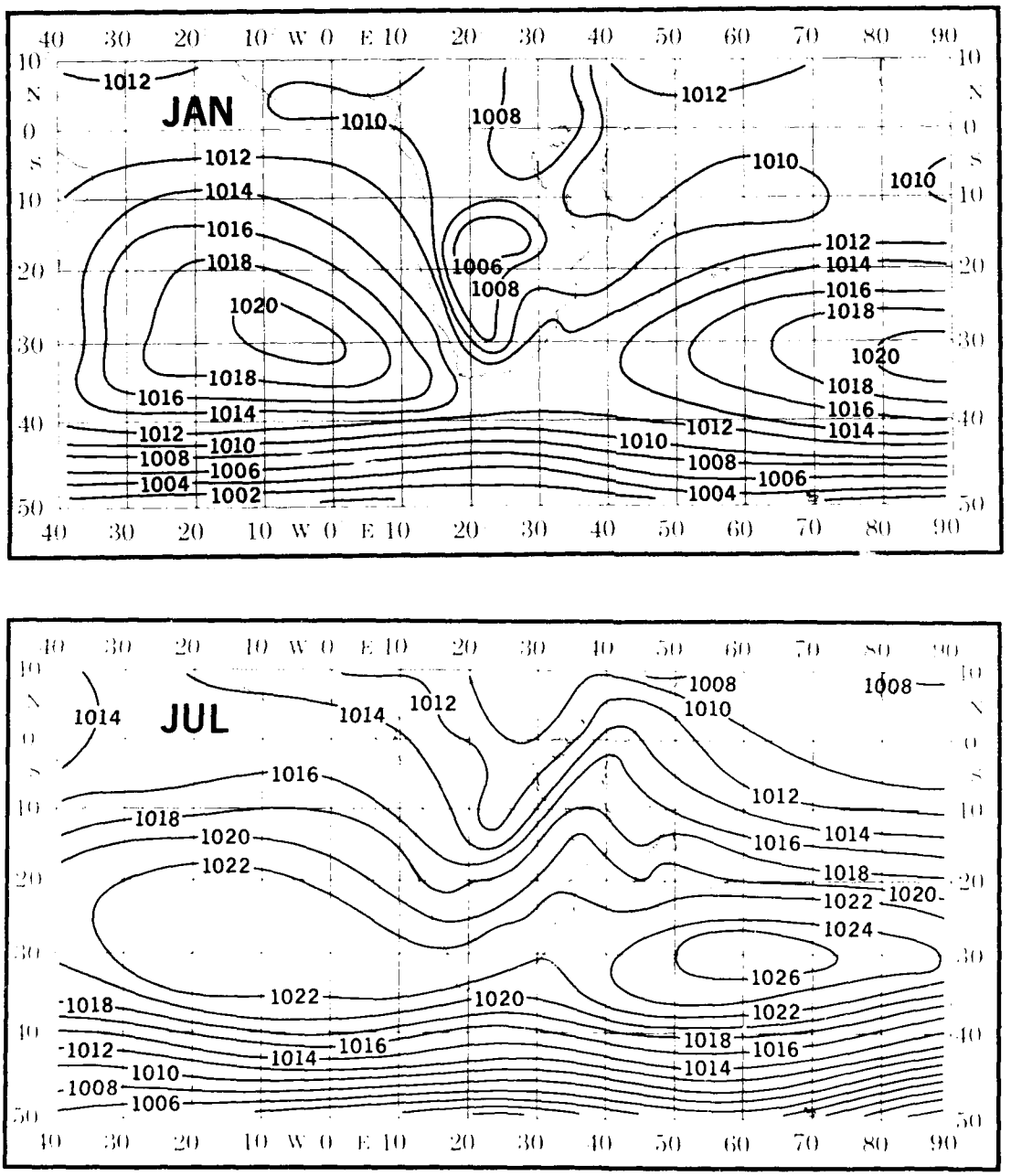

FIGURE 4. January and July Mean Sea-Level Pressure

Climate

The study area lies almost totally within the subtropical high pressure belt of the Southern Hemisphere (Figure 4). The high pressure belt is the main climate influence, and is the reason why the region is largely arid to semi-arid. The temperatures of southern Africa are cooler than those for most regions at the same latitude, and the uniformity of those temperatures is most remarkable. Because of the high interior plateau, the rise in elevation towards the equator offsets the increase in temperatures due to lower latitudes. Also, being surrounded by the southern oceans, the region is influenced by cool maritime air and the climate stability produced by the nearness of a large body of water. The coolest region is found along the great escarpment in the southeast, while the warmest temperatures are experienced in the low-lying valleys of the western interior along the Orange river (Figure 5).

The subtropical high off the west coast shows little annual variation, and this, along with the coastal upwelling, is mainly responsible for the lack of precipitation in the western part of southern Africa. Low clouds and fog often form along the coast; however, rarely does any rain fall. This also keeps the temperatures much cooler than normal for locations at these latitudes. Occasionally, however, warm abnormal temperatures appear with hot, dry "berg" winds which flow off the interior plateau.

Precipitation is usually in the form of rain with the greatest amounts falling in the east, and most of it falling during the summer. A wintertime maximum occurs at Cape Town, whereas the monthly distribution is somewhat evenly divided for locations along the south coast in the vicinity of Port Elizabeth. The effect of the orographic lift is significant as annual precipitation amounts along parts of the eastern escarpment increase on the order of one inch per 100 feet of elevation. The annual rainfall can vary considerably from year to year, with periodic droughts which are sometimes severe and prolonged.

In the region which has the summer precipitation maximum, most of the precipitation comes from thunderstorms and instability showers. However, along the escarpment, moist maritime air associated with anticyclonic flow can produce orographicly induced rain and drizzle. Much of the precipitation in the southern coastal region comes from frontal passages as maritime low pressure systems move south of the continent from west to east, generally in the "roaring" forties flow, with the trailing fronts often just skirting South Africa. Figure 5 presents the mean monthly precipitation amounts and temperatures for a few select

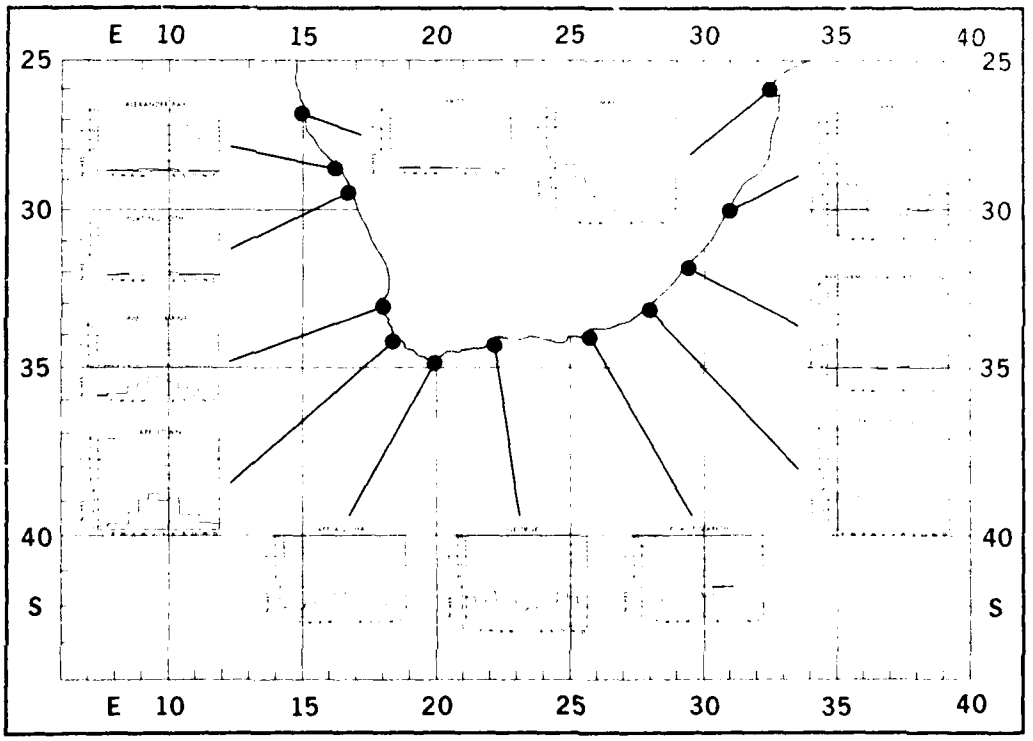

FIGURE 5. Mean Annual Air Temperature and Precipitation

stations. Severe hailstorms occasionally accompany thunderstorms in the eastern high plateau region. This has lead the government to support cloud-seeding projects in hopes of lessening some of the damage. On occasion, severe flooding has also occurred in southern Africa, causing damage to crops, roads, and bridges.

Extreme low temperatures between 10°F and 20°F have been observed at most stations in the eastern and southern highlands south of 21°S. Freezing temperatures are recorded during the summer at the higher elevations. Although many areas have fairly cold temperatures during the late evening to early morning hours of winter, the afternoons are often mild or even warm. Summertime maximum temperatures of 90°F or higher are most frequent at the interior plateaus and the eastern lowlands. However, the highest temperatures have been observed in the western valleys of the Orange river.

Frost is not an uncommon event in the higher plateaus and valleys of southern Africa from mid-May to mid-September. All regions of the high plateaus, south of 23°S, are subject to at least one day of frost each winter. Snow is also limited to the areas south of 23°S, with most snowfalls occurring during June and July in the higher mountains of southern and southeastern South Africa.

Marine Climatological Elements

Precipitation

Of the elements recorded in the marine data base, precipitation is the one most subject to error in both the way it is observed and the way it is interpreted. For example, it is often inferred in the literature that ships often try to avoid foul weather and thereby bias the data towards fair weather with fewer precipitation observations. Elms (1986) compared the Volunteer Observing Ship (VOS) observations to other sources of data such as Ocean Station Vessel (OSV) and buoys, finding little evidence that "fair weather bias" is a serious problem for most applications of marine climatic data. With the introduction in 1982 of a present weather indicator (i_x) to the international Ship Synoptic Code FM13-VII, users have to be careful not to bias the data, especially that from between January 1982 and March 1985 when the indicator was inadvertently left out of the international data exchange format.

In comparing the frequencies given on the precipitation charts in this volume to those in the U.S. Navy Marine Climatic Atlas of the World, Volume III, Indian Ocean (Revised 1976) and Volume IV, South Atlantic Ocean (Revised 1978), one will generally see a smaller percentage of present weather observations reporting precipitation. The major reason for this is that in the earlier publication the weather codes 20-27 (precipitation in the past hour) were counted in the precipitation frequencies in order to help correct an apparent observation bias. For this regional climatic study it was decided to present the data as reported. The higher frequencies (20-27 code included) certainly seem to agree better with those for land stations and OSV sites for most regions of the globe. The 1982 code change may also affect the frequencies. A more in-depth study is needed to help decide which method best represents the climate. At this point, however, it is possible only to bring the issue to the attention of the data users. Even without the coding problems, assessing oceanic rainfall data is a major problem because transit ships are unable to take quantitative precipitation measurements. A number of studies have been conducted in efforts to predict precipitation amounts, or rates of fall, based on estimates derived from the use of present weather observations from ships of opportunity (Gorodn, et al., 1984) and readings from satellites (Rao, et al., 1976).

Air Temperature

Air temperature is one of the elements most frequently observed by mariners. It should be noted that on many ships the heating effect of the ship's structure has a tendency to produce higher than actual ambient air temperature readings because of instrument exposure (Folland et al., 1984; Wright, 1986). This is especially true under calm, sunny conditions. Therefore, some ship temperature observations have a warm bias; however, the aggregate is relatively representative after erroneous outliers have been eliminated and the numerous nighttime observations and unbiased daytime observations are included. Also, true extremes are rarely captured since continuous observations are not made at most ocean locations. It is highly unlikely that a ship-of-opportunity would be taking its synoptic weather observation at the exact time that an extreme was occurring.

Sea-Surface Temperature

Sea-surface temperatures are recorded with a fairly high frequency in marine observations. The principle methods for sampling are with ship water-intake thermometers and by reading the temperature of sea water retrieved with the buckets. Even though the two methods can produce slightly different results (Barnett, 1984), the data can be used with considerable confidence when examining the long-term means.

Surface Winds

Surface wind is one of the most commonly observed elements. Many of the observations from the NCDC data base are visual observations based on the roughness of the sea. In recent years, more ships acquired anemometers and reported measured winds. Prior to 1963, many observed wind speeds were recorded in the Beaufort scale; such estimates have proven to be quite reliable and can be used with a high degree of confidence. Five sets of wind speed isopleths are presented: the scalar mean speed and the percent of frequency of winds less than 11 knots, from 11 to 21 knots, from 22 to 33 knots, and greater than or equal to 34 knots. Also given are wind roses for one-degree squares.

Visibility

Visibilities are difficult to measure at sea because of the lack of distance reference points. Climatically, many low visibility observations are probably missed because the observer is too busy with other duties (a contrasting form of fair weather bias). However, the coarseness of visibility (code) intervals helps to minimize the problem, thereby permitting the summarized data to be relatively consistent.

Clouds

A survey of the cloud data (total and low cloud amount) from the surface marine observation data base shows that the number of total cloud reports are significantly greater than that of low cloud amounts. This is because many of the early marine observations contain only total cloud amount. For the two presentations (total cloud amount $\leq$ 2/8, and low cloud amount $\geq$ 5/8), only those observations reporting both total and low cloud amounts were summarized. This helps eliminate problems introduced as a result of different size data sets (N-count). The use of satellite data helps to bolster confidence in the total cloud analyses because they show fairly close agreement with those analyses (U.S. Department of Commerce and United States Air Force, 1971).

Ceiling and Visibility

Aircraft-type ceilings are not available from marine observations. The ceilings are estimated from the height of the lowest cloud when low clouds cover more than half the sky. When the sky is totally obscured by rain, fog, dust, or other phenomena, the total obscuration is considered a ceiling with a height of zero. Mid-range ceiling and visibility charts (ceiling less than 1000 feet and/or visibility less than 5 nautical miles; ceiling less than 8000 feet and/or visibility less than 10 nautical miles) and low-range ceiling and visibility charts (ceilings less than 300 feet and/or visibility less than 1 nautical mile; ceiling less than 600 feet and/or visibility less than 2 nautical miles) are presented.

Wave-Heights

Wave-heights have been recorded in a consistent quantitative code since the late 1940's. The reluctance of many observers to take wave observations in the earlier years and the difficulty in estimating waves, especially in confused seas, make wave observations one of the least commonly observed elements. The observations are also subject to biases. Generally, the heights are too low, the periods too short, and the sea-swell discrimination poor (Quayle, 1980). The data in this study have not been adjusted for the suspected biases, but were processed through a quality control procedure wherein an internal check was made between wind speed and sea height. The data were also matrix-arrayed and apparent erroneous outlier data values were deleted from both the sea and swell data. Wave-height presentations include isopleth maps showing percent frequencies of wave-heights $\geq$ 3 feet and $\geq$ 8 feet. In addition, wave-height tables by one-degree square show frequencies by six wave-height categories. In these presentations, the higher of the sea or swell was selected for summarization. If heights were equal, the wave with the longer period was selected.

Ocean Currents

The ocean current charts were compiled from ship drift reports that were forwarded by the various merchant marines to the U.S. Naval Oceanographic Office. From those drift observations, the prevailing and secondary current directions, mean current speed, percent of total observations used to compute the primary and secondary directions, and the total observation count are presented by one-degree square. This information is presented on monthly charts with the study area being divided into four sections (pages) to ensure readability. However, the southernmost two charts were not included in the final publication because the data were too sparse to provide representative statistics. The density of the observations is greatest along the major shipping routes and the reliability of the current charts is best in those areas. The data are considered most useful when used collectively, such as in summaries where a large number of observations are available.

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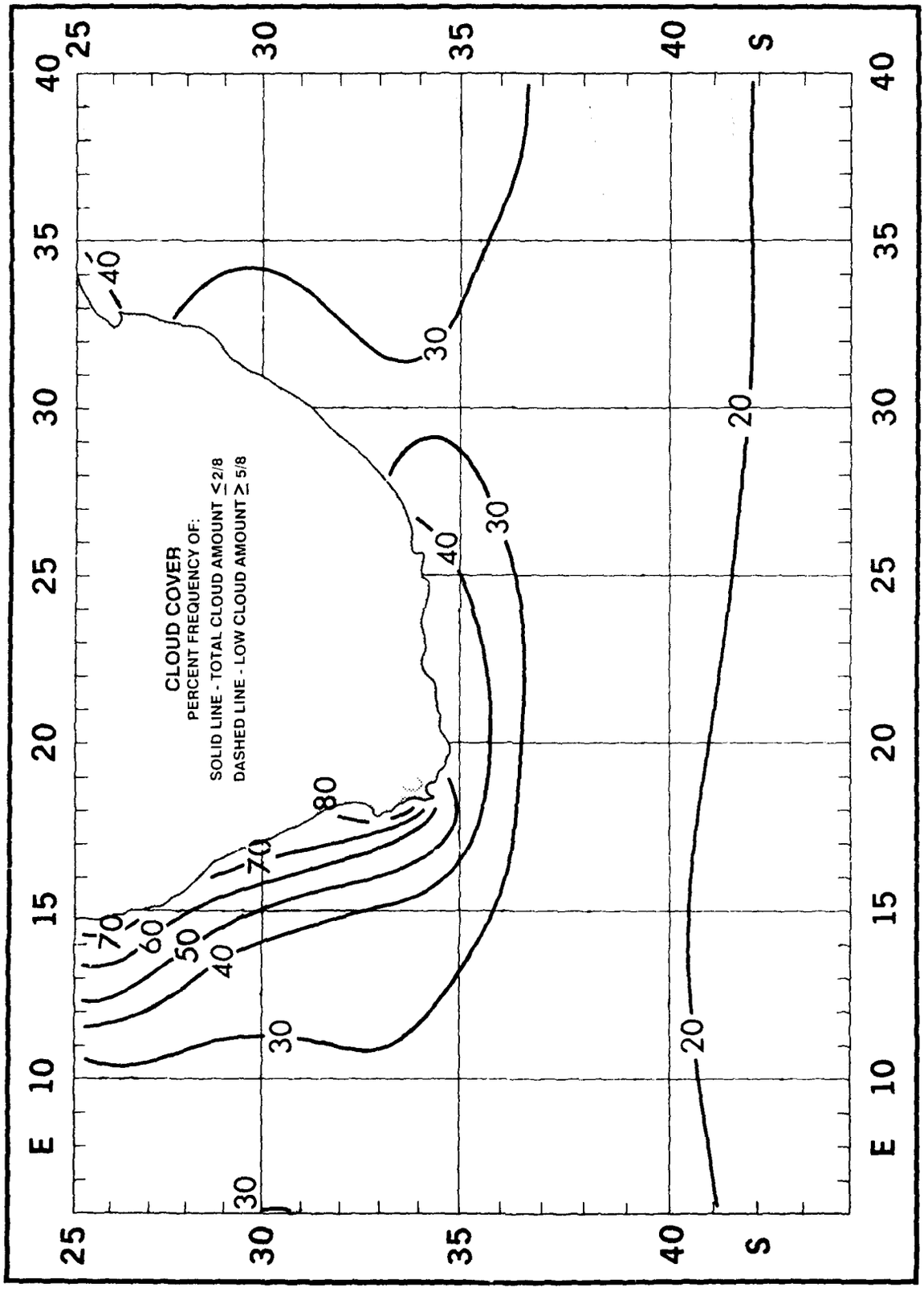
PAGE INDEX

EXAMPLE: The 'MEAN SCALAR WIND SPEED' for July is found on page 129.

MONTH / ELEMENT	CLOUDS	PRECIPITATION	VISIBILITY-TABLES	CEILING-VISIBILITY (mid range)	CEILING-VISIBILITY (low range)	WIND-VISIBILITY-CLOUDINESS	MEAN SCALAR WIND SPEED	WIND SPEED < 11 and ≥ 34 KNOTS	WIND SPEED 11-21 and 22-33 KNOTS	SURFACE WIND ROSES	AIR AND SEA TEMPERATURE	WAVE HEIGHT-ISOPLETHS	WAVE HEIGHT-TABLES	SURFACE CURRENTS	STATION CLIMATIC SUMMARIES
JANUARY	2	3	4	6	7	8	9	10	11	12	16	17	18	20	242 thru 251
FEBRUARY	22	23	24	26	27	28	29	30	31	32	36	37	38	40	
MARCH	42	43	44	46	47	48	49	50	51	52	56	57	58	60	
APRIL	62	63	64	66	67	68	69	70	71	72	76	77	78	80	
MAY	82	83	84	86	87	88	89	90	91	92	96	97	98	100	
JUNE	102	103	104	106	107	108	109	110	111	112	116	117	118	120	
JULY	122	123	124	126	127	128	129	130	131	132	136	137	138	140	
AUGUST	142	143	144	146	147	148	149	150	151	152	156	157	158	160	
SEPTEMBER	162	163	164	166	167	168	169	170	171	172	176	177	178	180	
OCTOBER	182	183	184	186	187	188	189	190	191	192	196	197	198	200	
NOVEMBER	202	203	204	206	207	208	209	210	211	212	216	217	218	220	
DECEMBER	222	223	224	226	227	228	229	230	231	232	236	237	238	240	


CLOUD COVER
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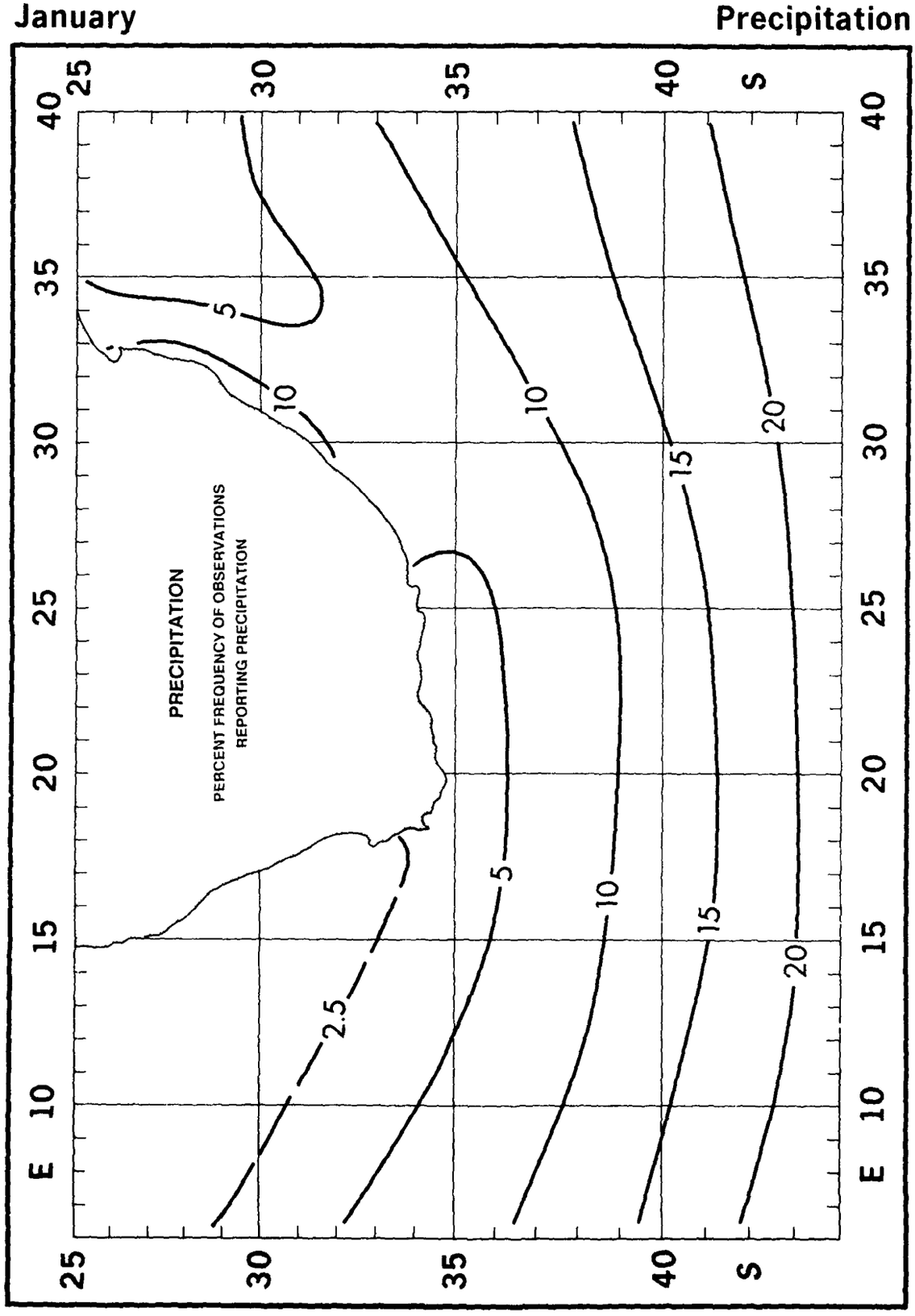
January
Precipitation
PRECIPITATION
PERCENT FREQUENCY OF OBSERVATIONS
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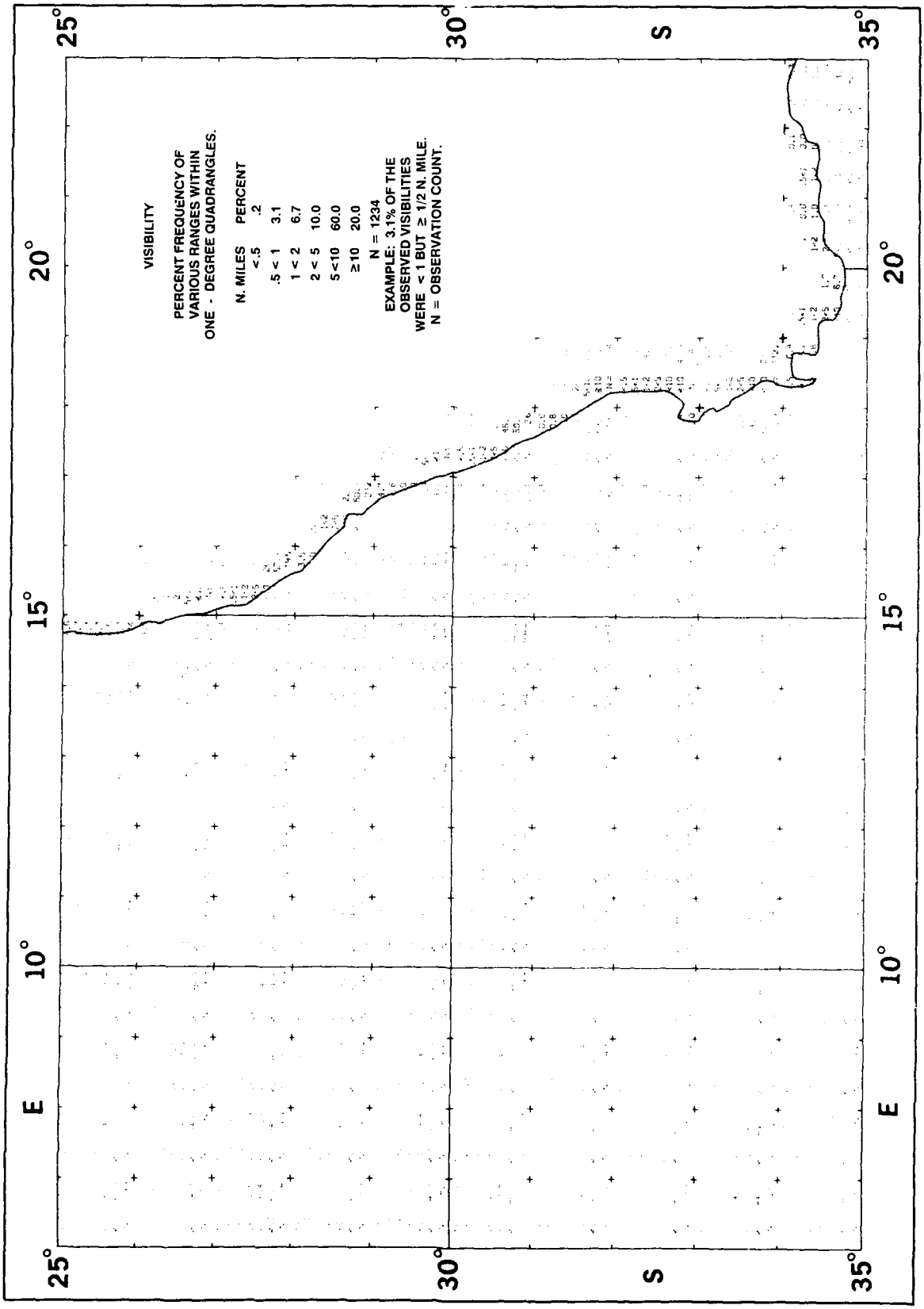
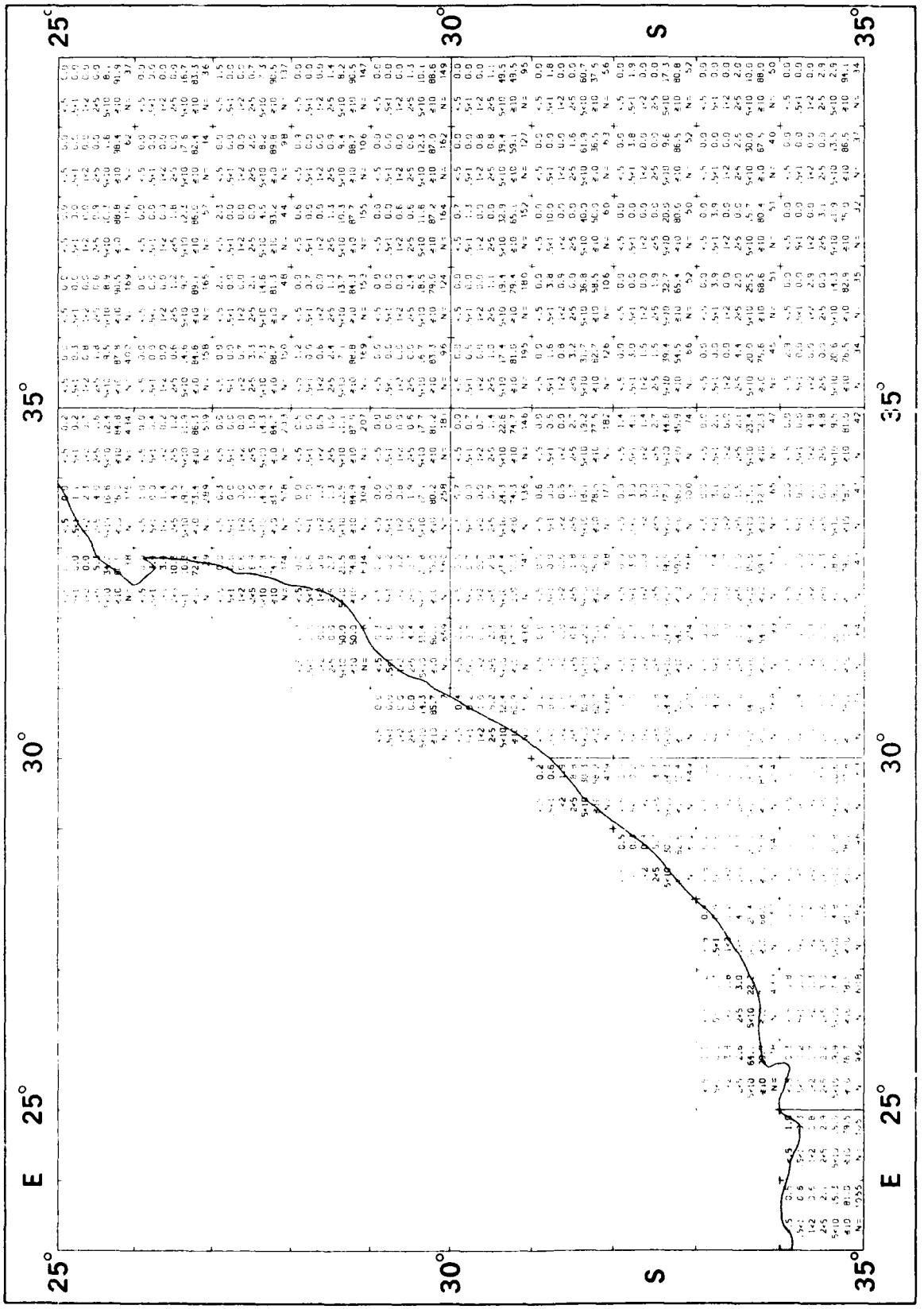
January

Visibility

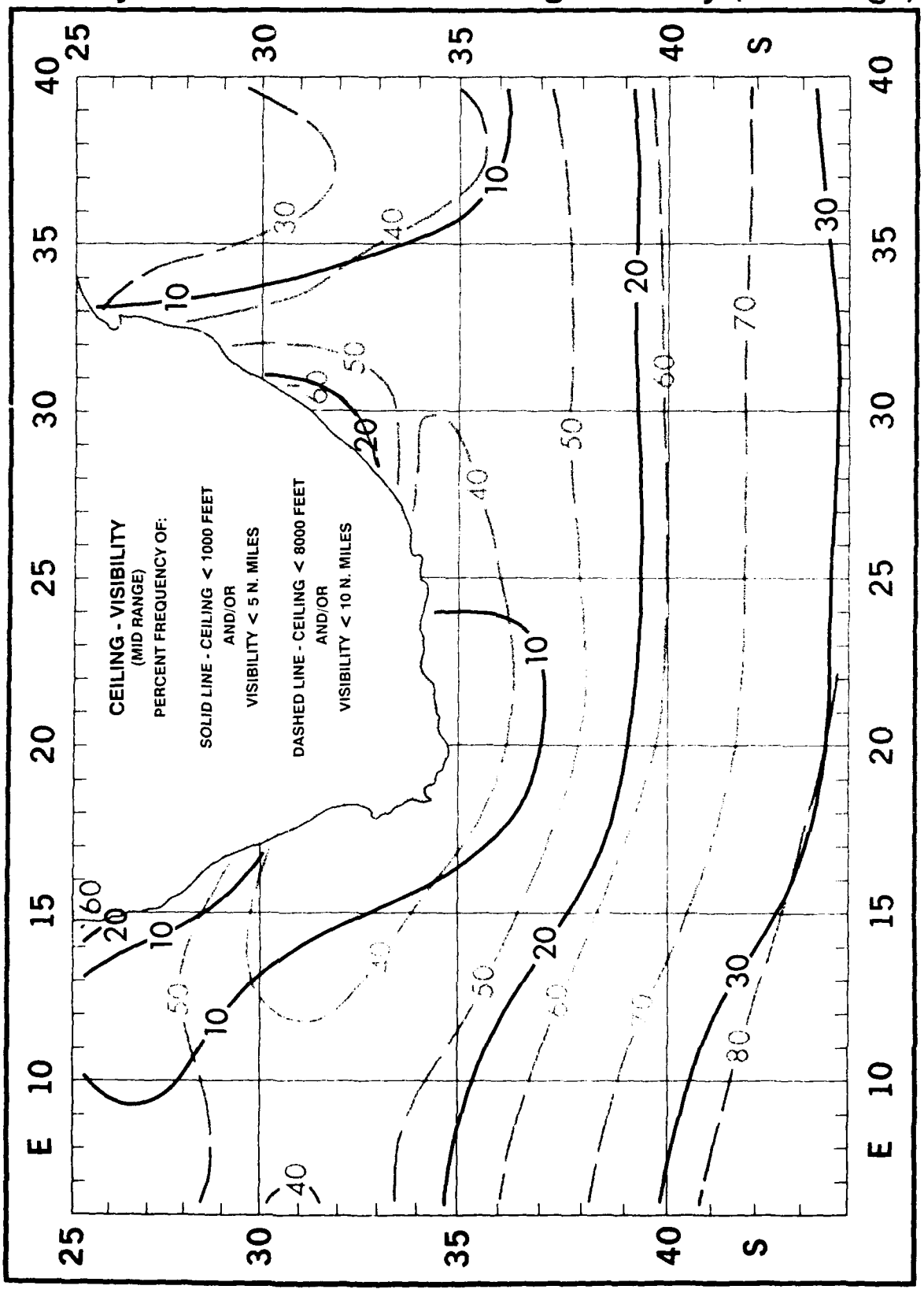


January

Visibility

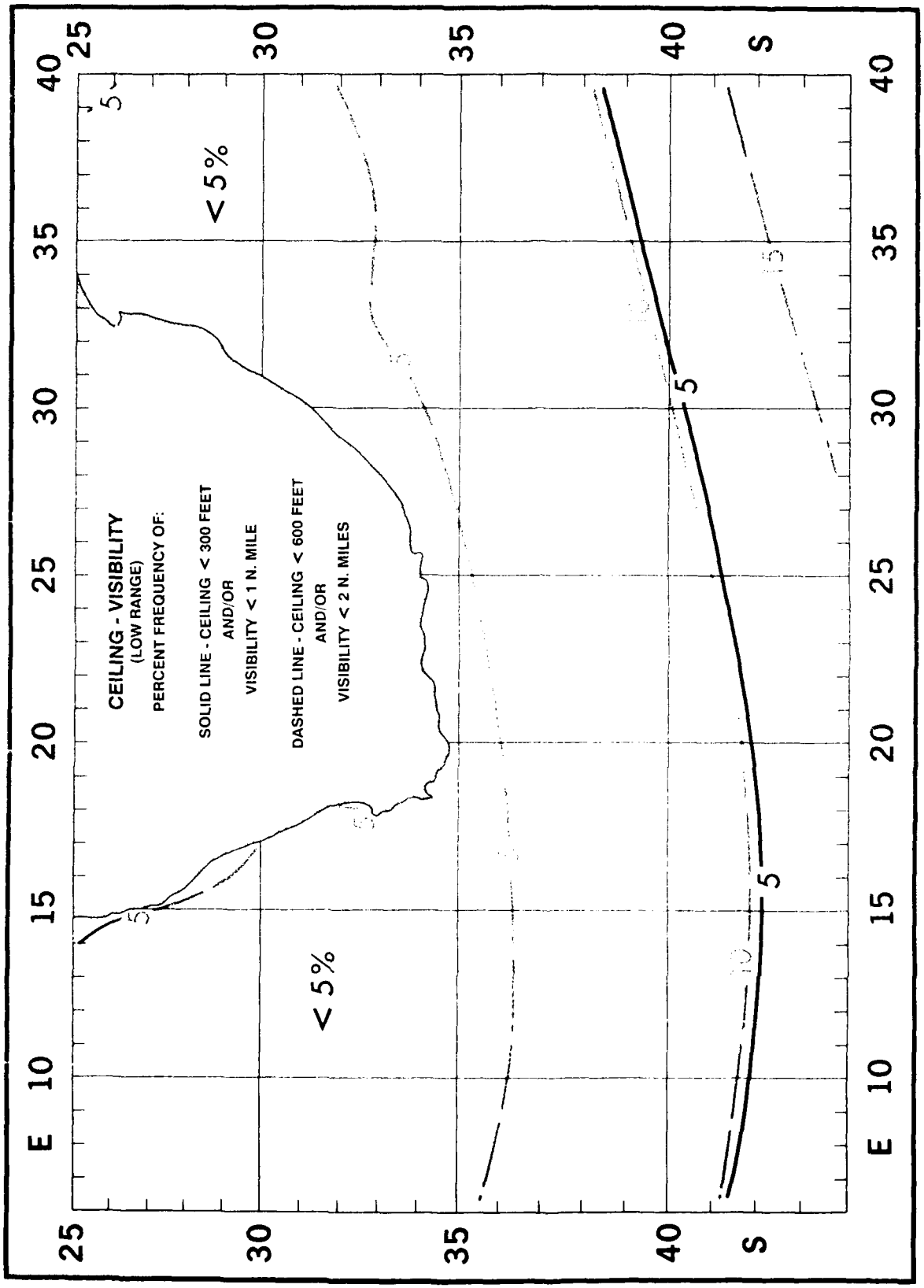


January **Ceiling - Visibility (Mid Range)**



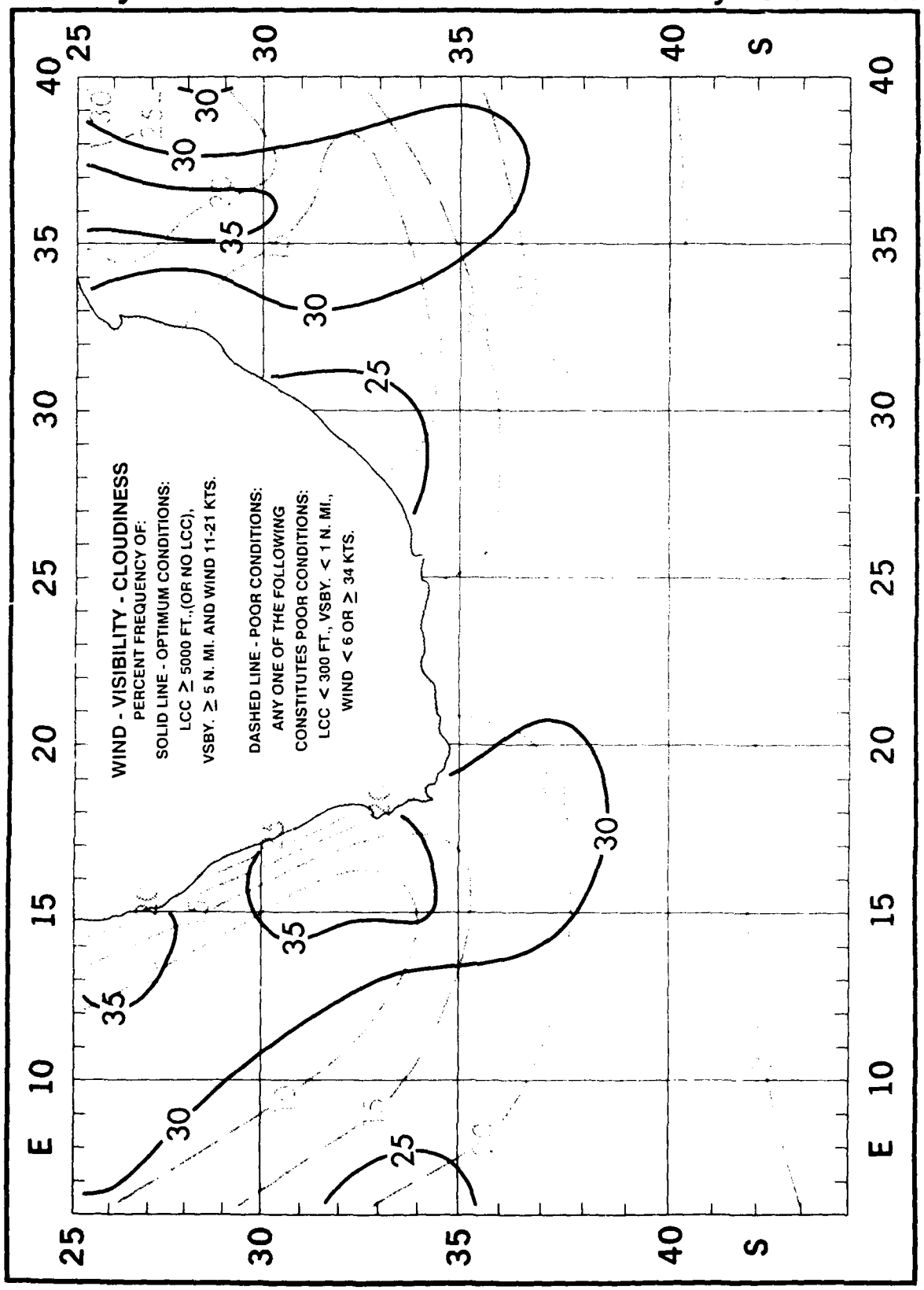
January

Ceiling - Visibility (Low Range)



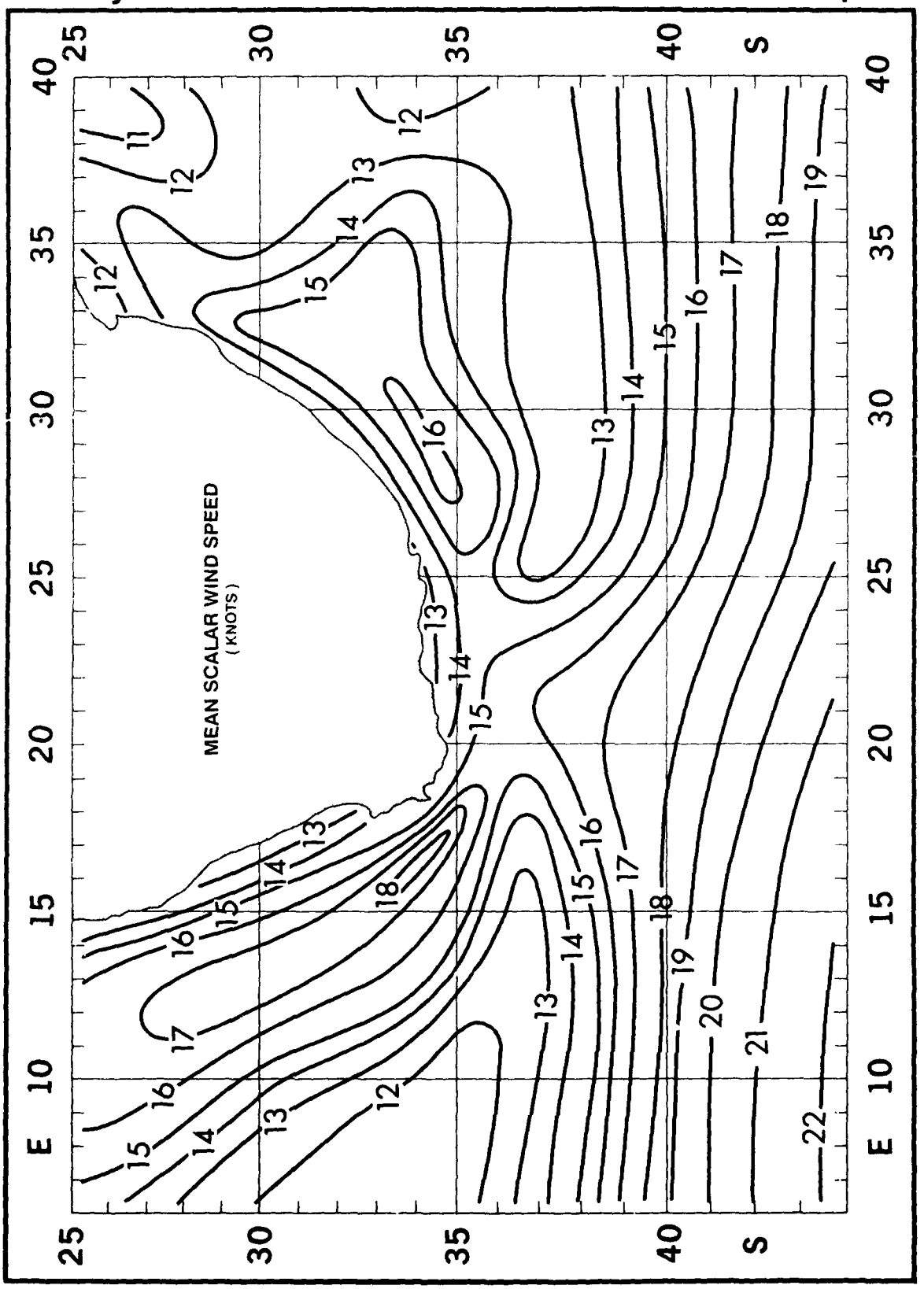
January

Wind - Visibility - Cloudiness

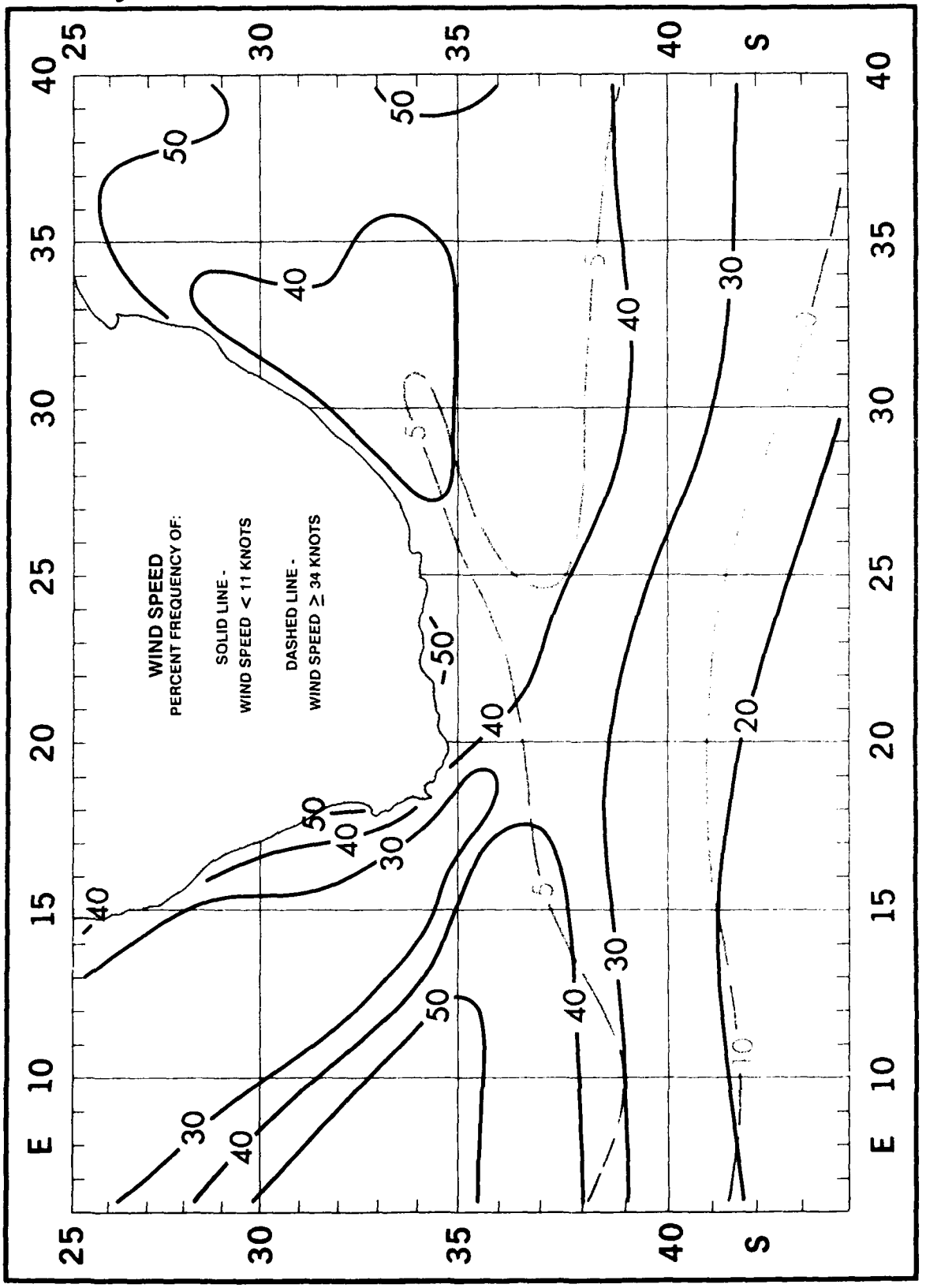


January

Mean Scalar Wind Speed

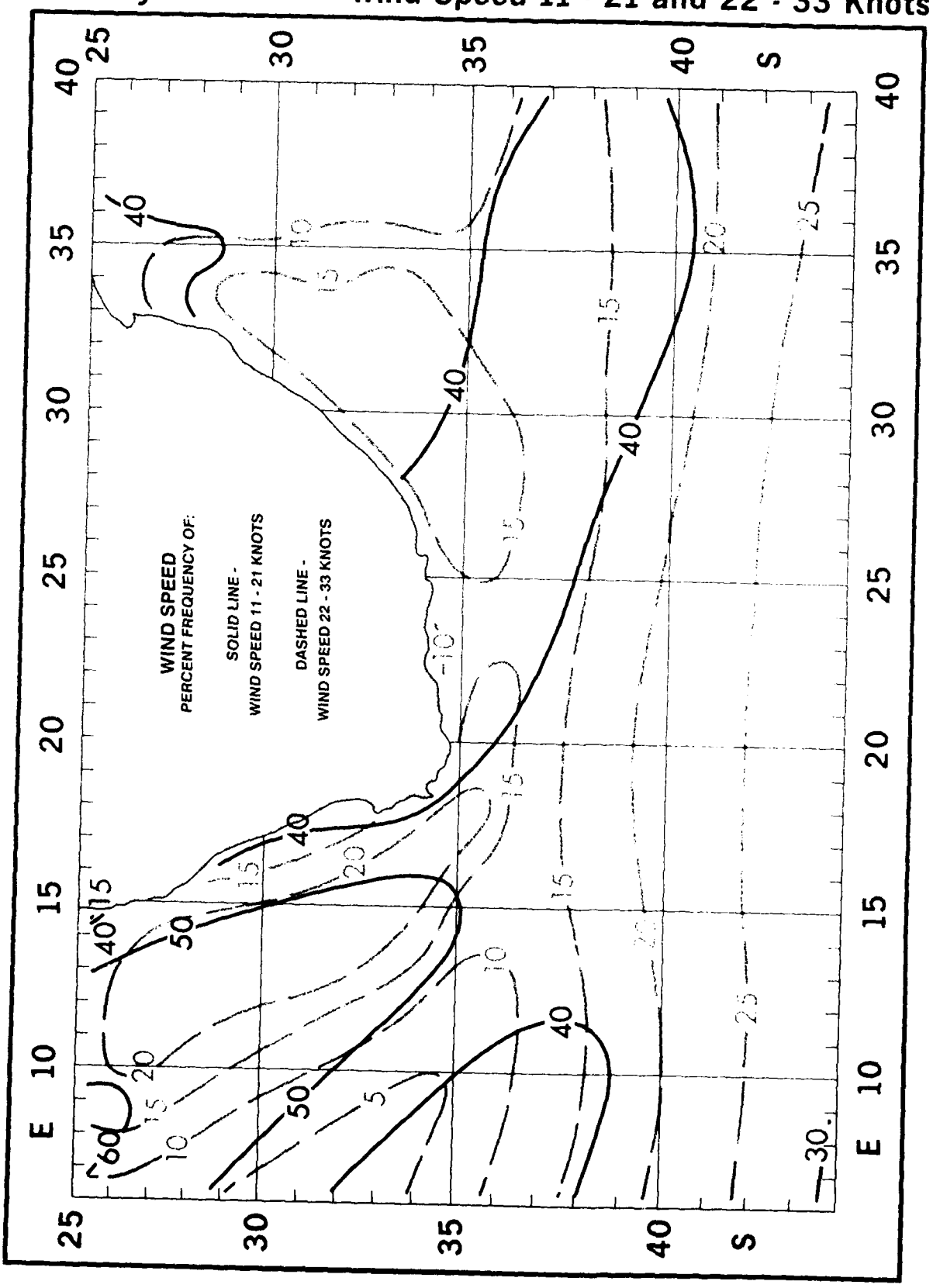


January **Wind Speed <11 and ≥34 Knots**



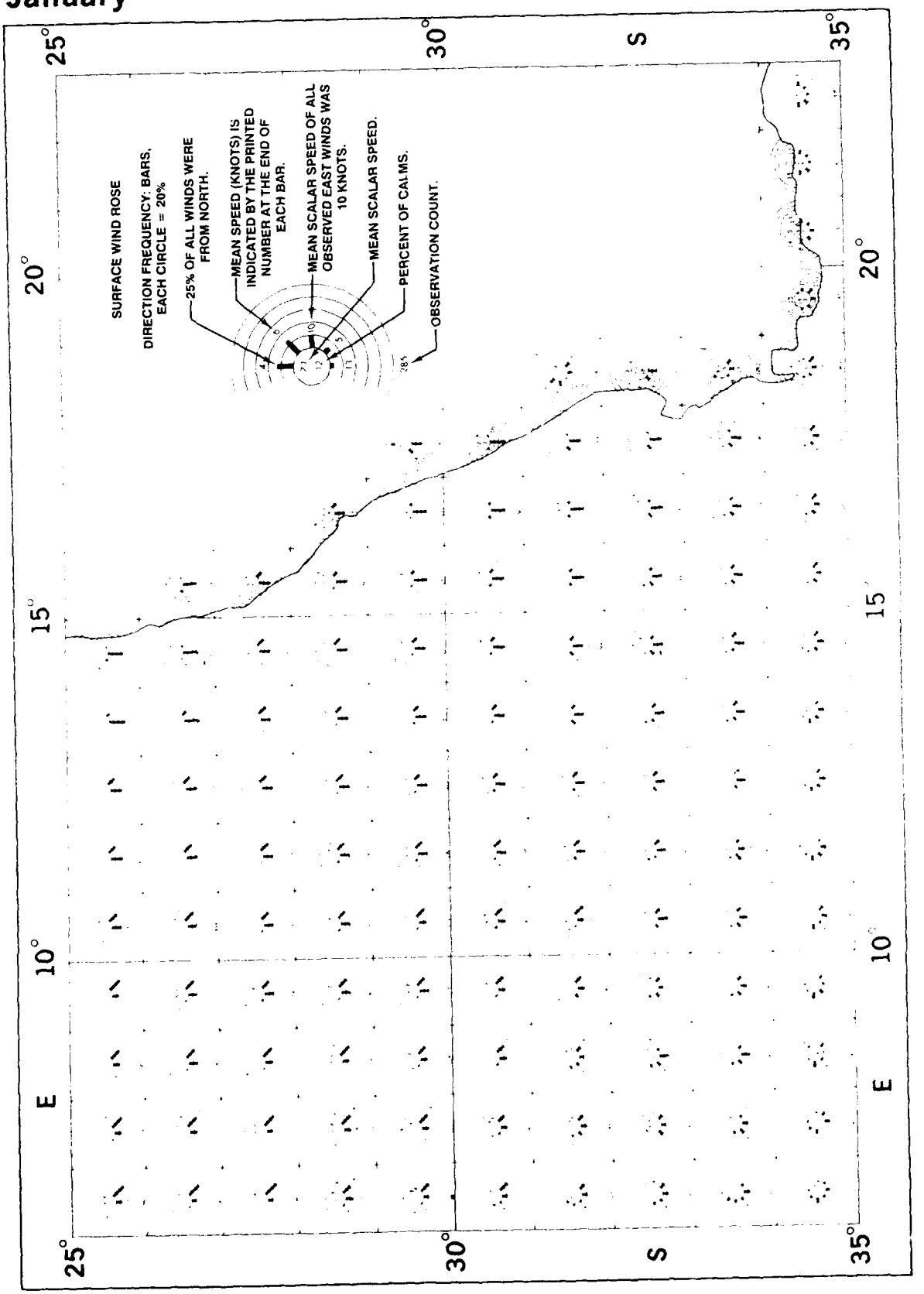
January

Wind Speed 11 - 21 and 22 - 33 Knots



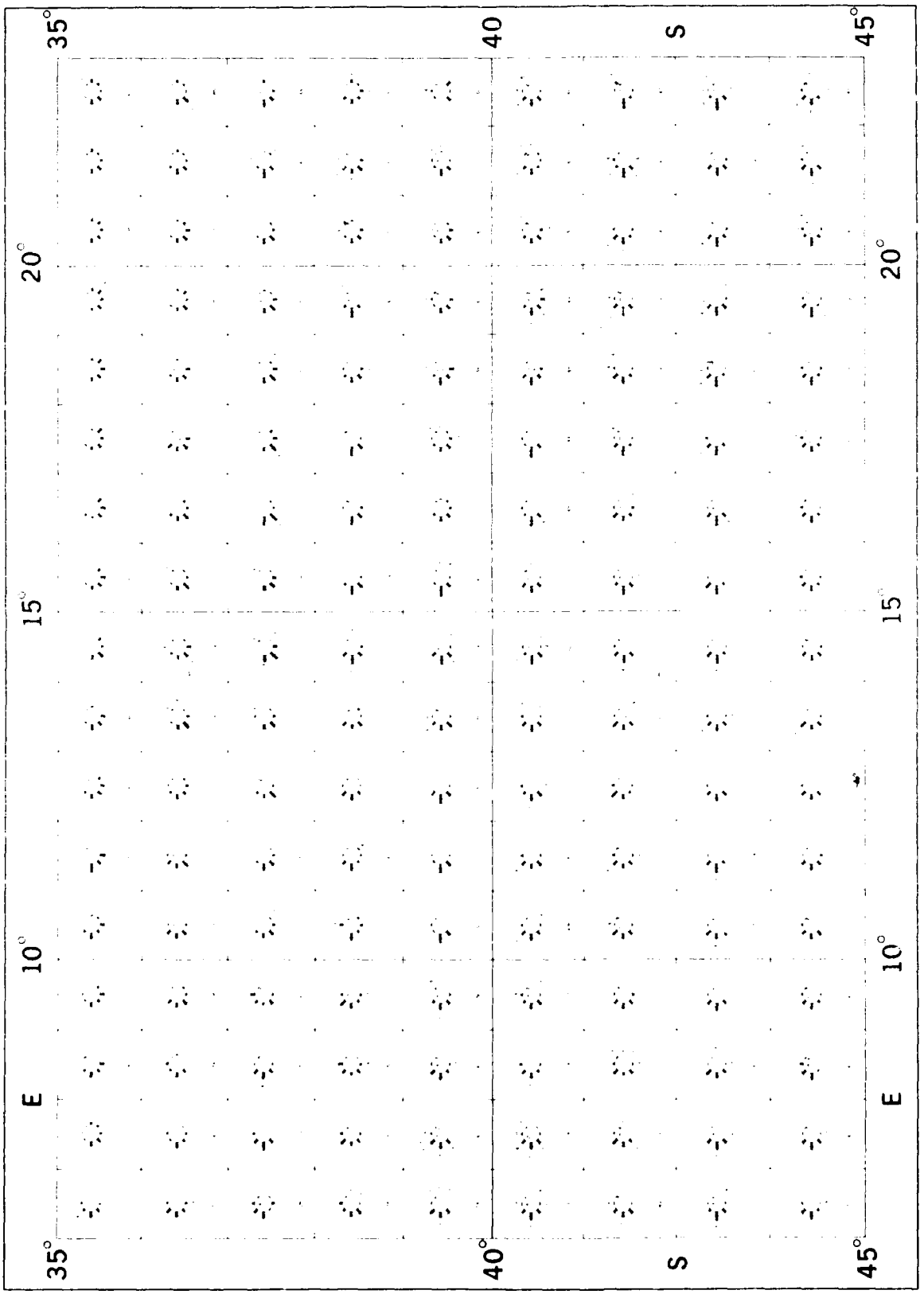
January

Surface Wind Roses



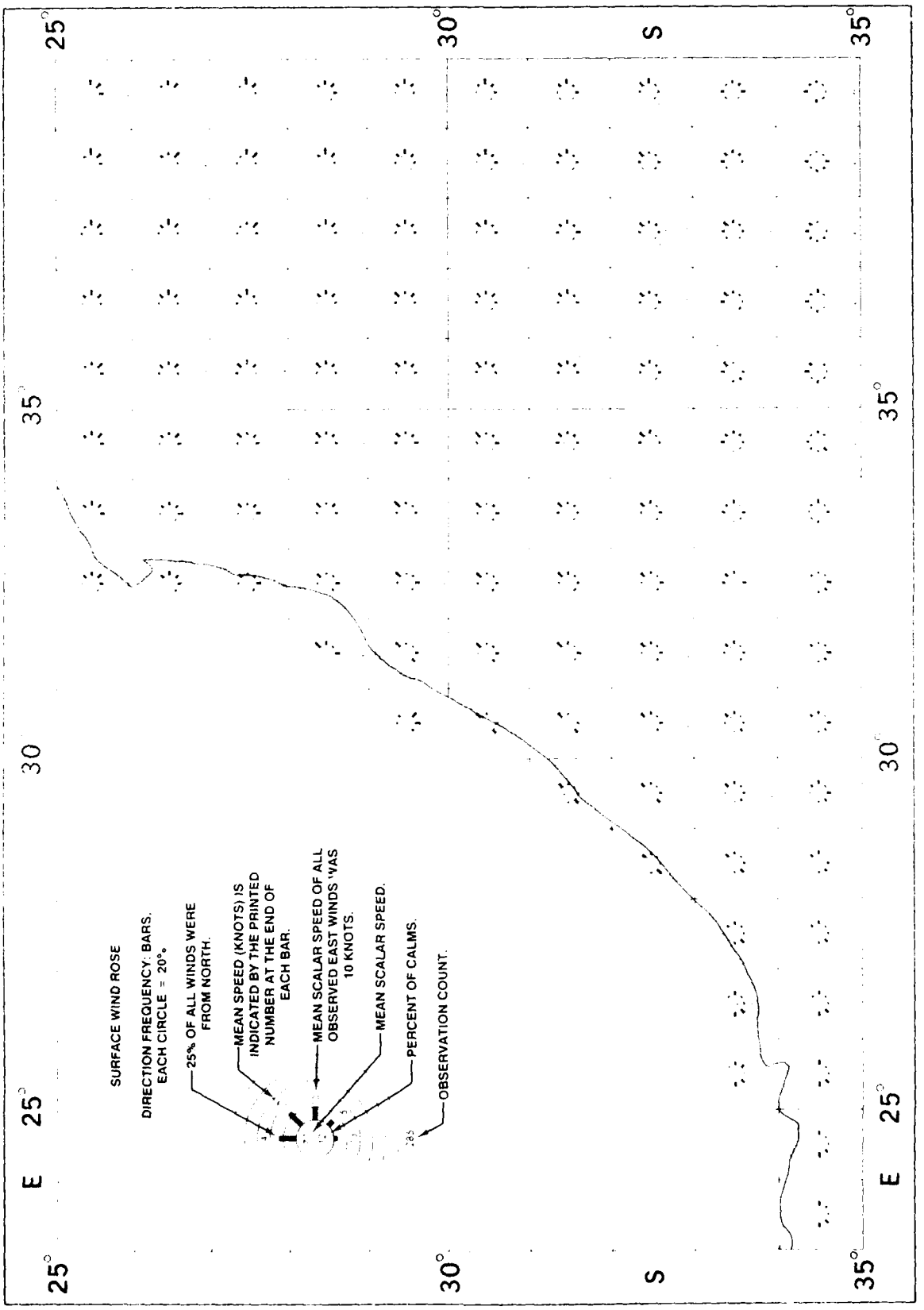
January

Surface Wind Roses



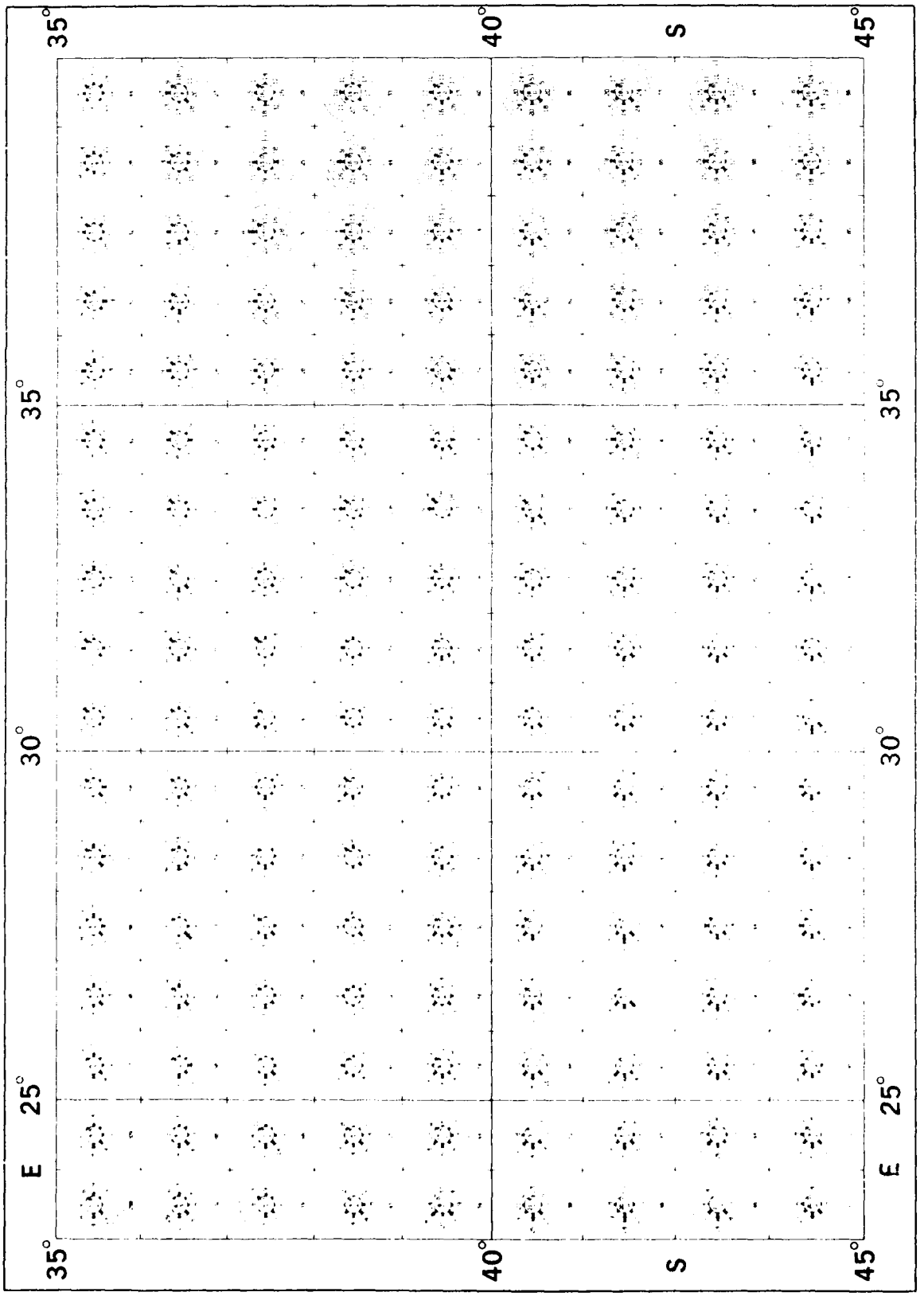
January

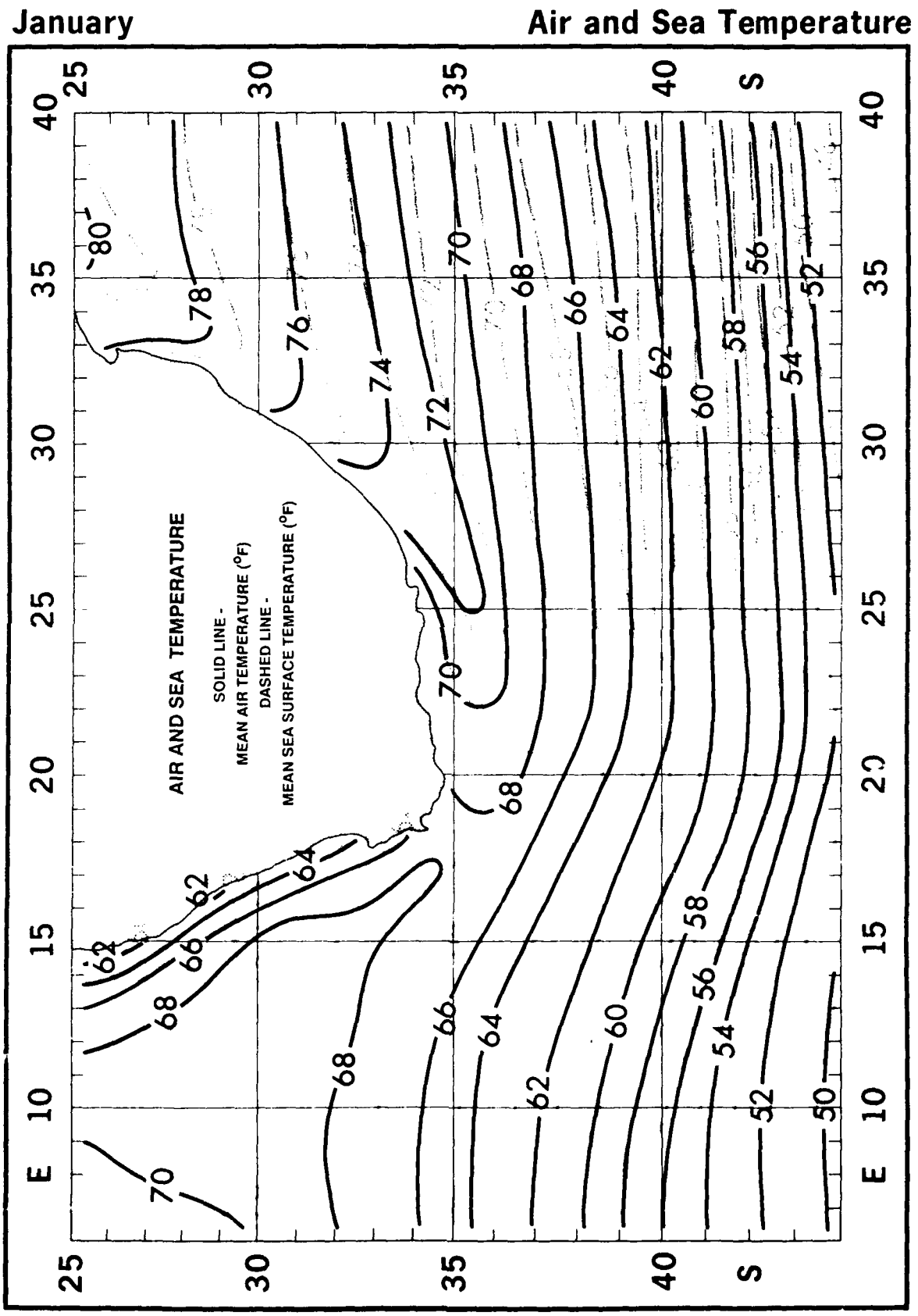
Surface Wind Roses

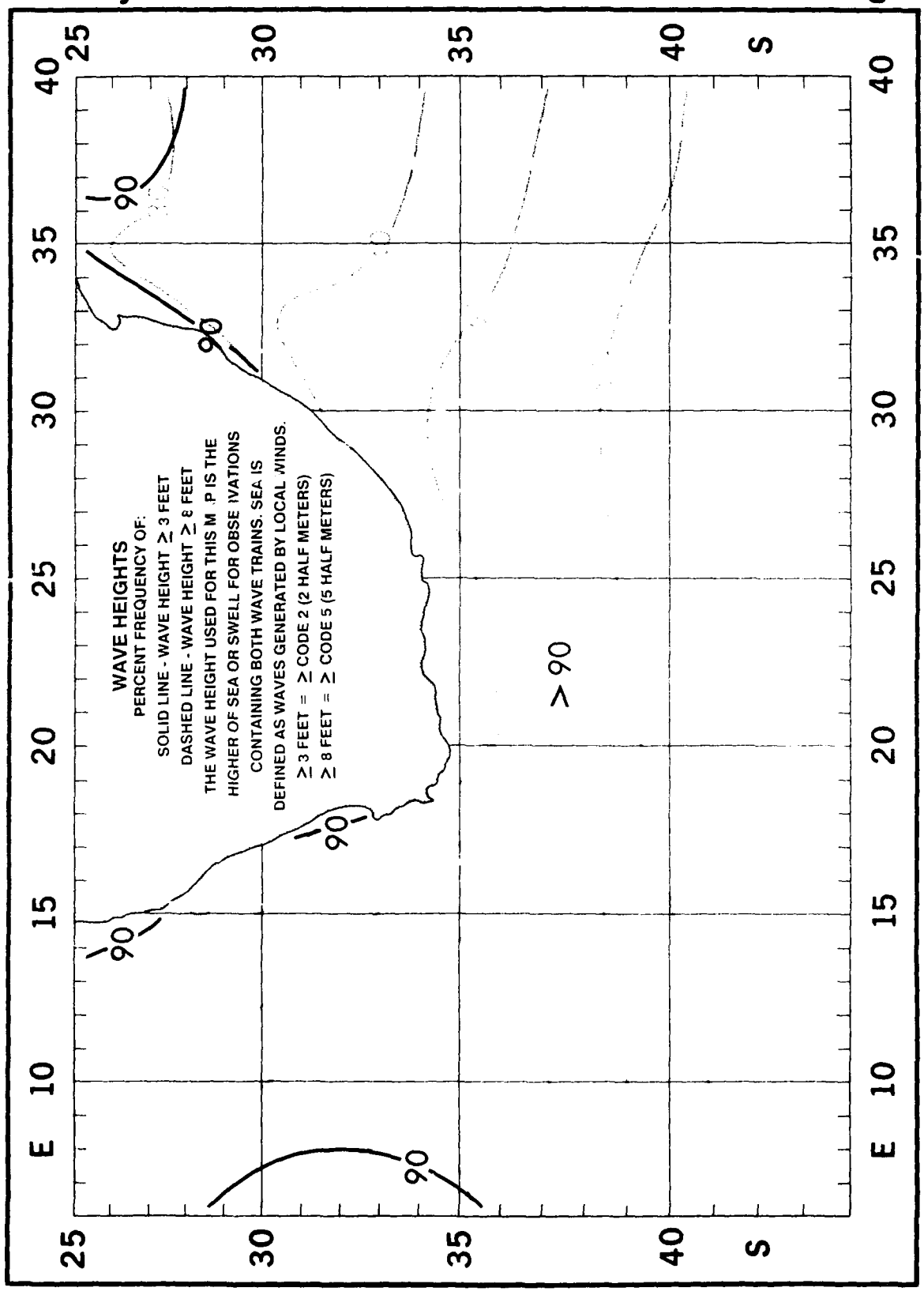


January

Surface Wind Roses

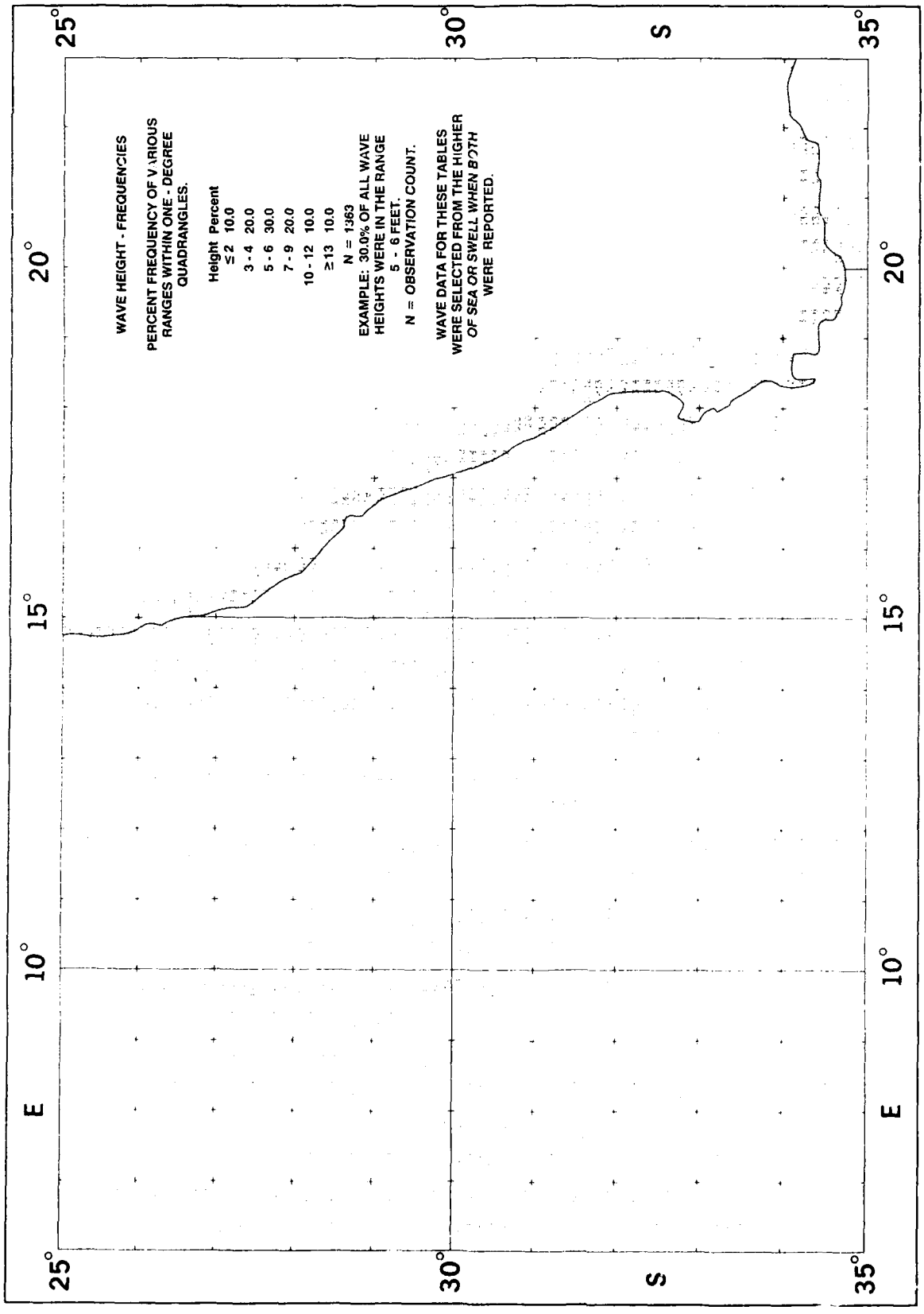



January
Air and Sea Temperature
AIR AND SEA TEMPERATURE
SOLID LINE -
MEAN AIR TEMPERATURE (°F)
DASHED LINE -
MEAN SEA SURFACE TEMPERATURE (°F)
E
S
25
30
35
40
10
15
20

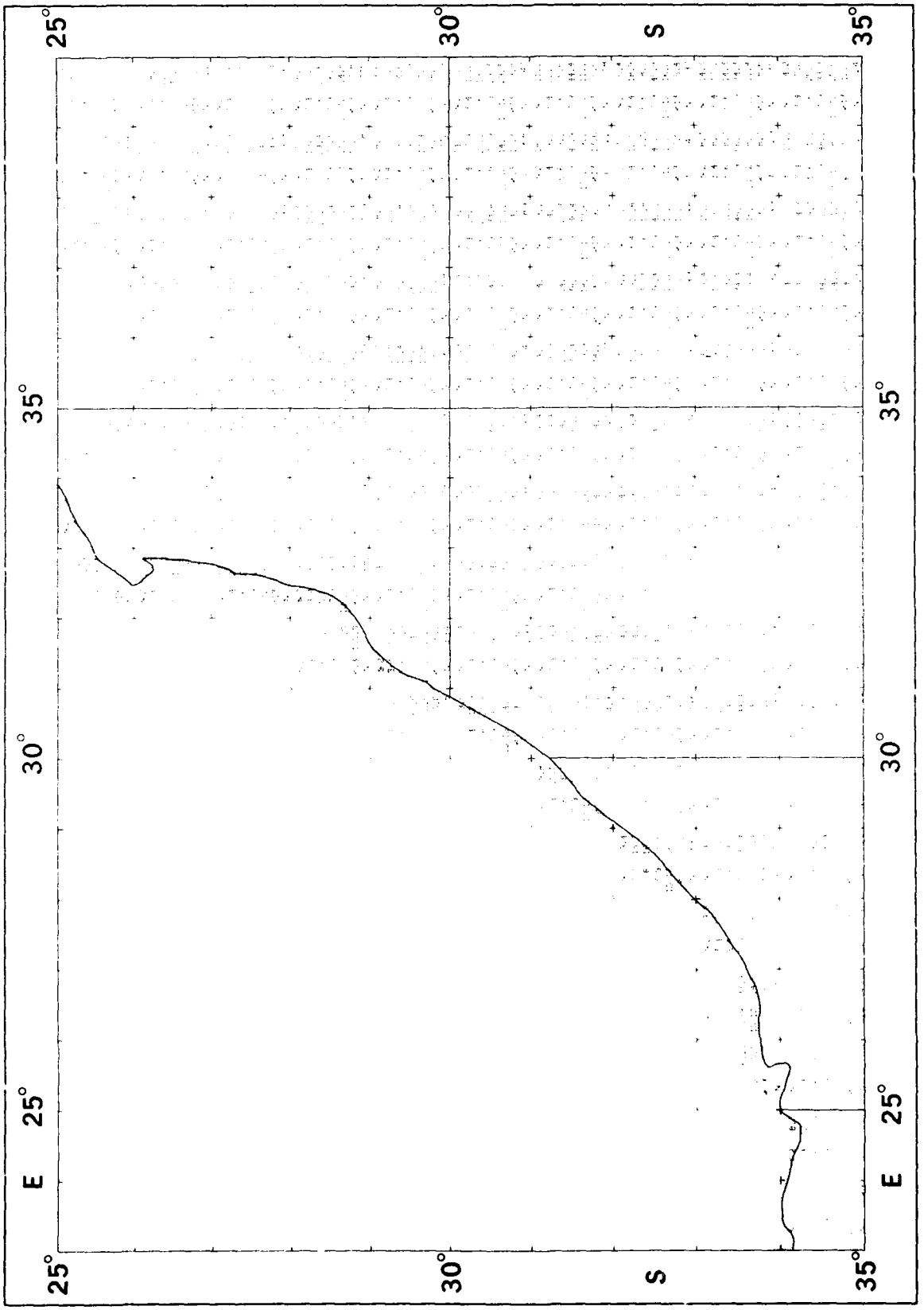

January
Wave Height
WAVE HEIGHTS
PERCENT FREQUENCY OF:
SOLID LINE - WAVE HEIGHT ≥ 3 FEET
DASHED LINE - WAVE HEIGHT ≥ 8 FEET
THE WAVE HEIGHT USED FOR THIS M .P IS THE
HIGHER OF SEA OR SWELL FOR OBSE IVATIONS
CONTAINING BOTH WAVE TRAINS. SEA IS
DEFINED AS WAVES GENERATED BY LOCAL WINDS.
≥ 3 FEET = ≥ CODE 2 (2 HALF METERS)
≥ 8 FEET = ≥ CODE 5 (5 HALF METERS)
> 90
90
E 10 15 20 25 30 35 40 S
25 30 35 40 S

January

Wave Height

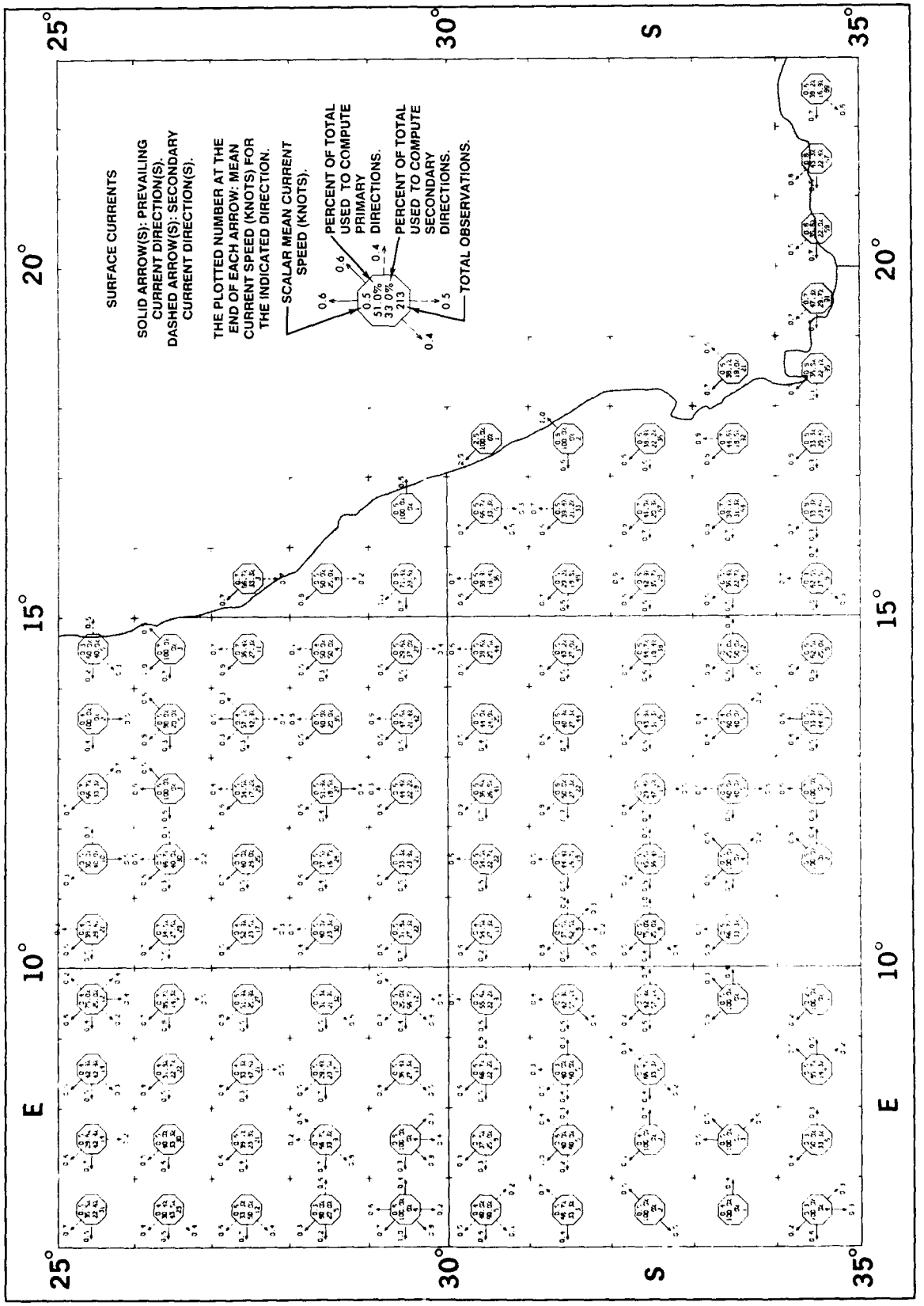


January **Wave Height**



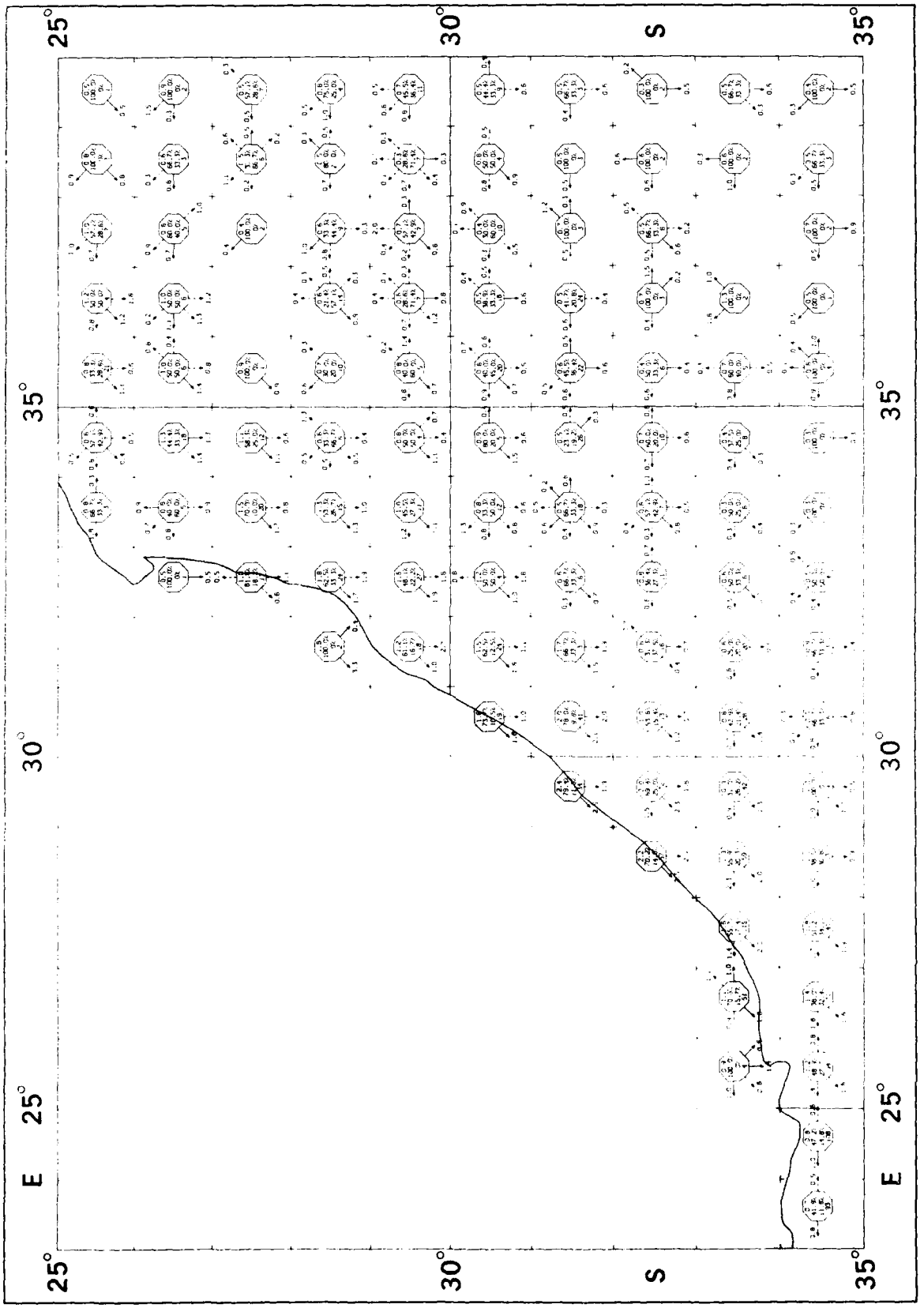
January

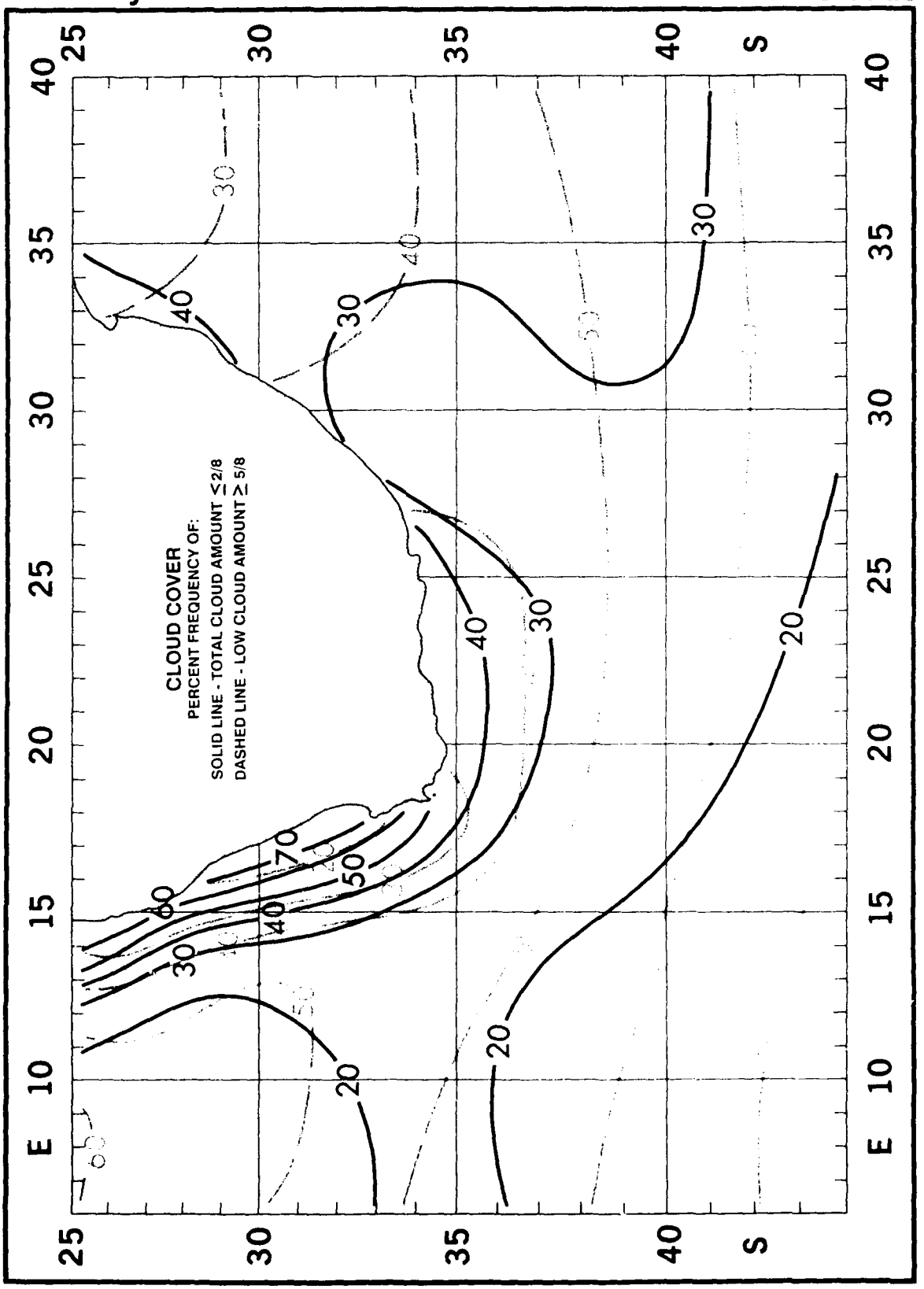
Surface Currents



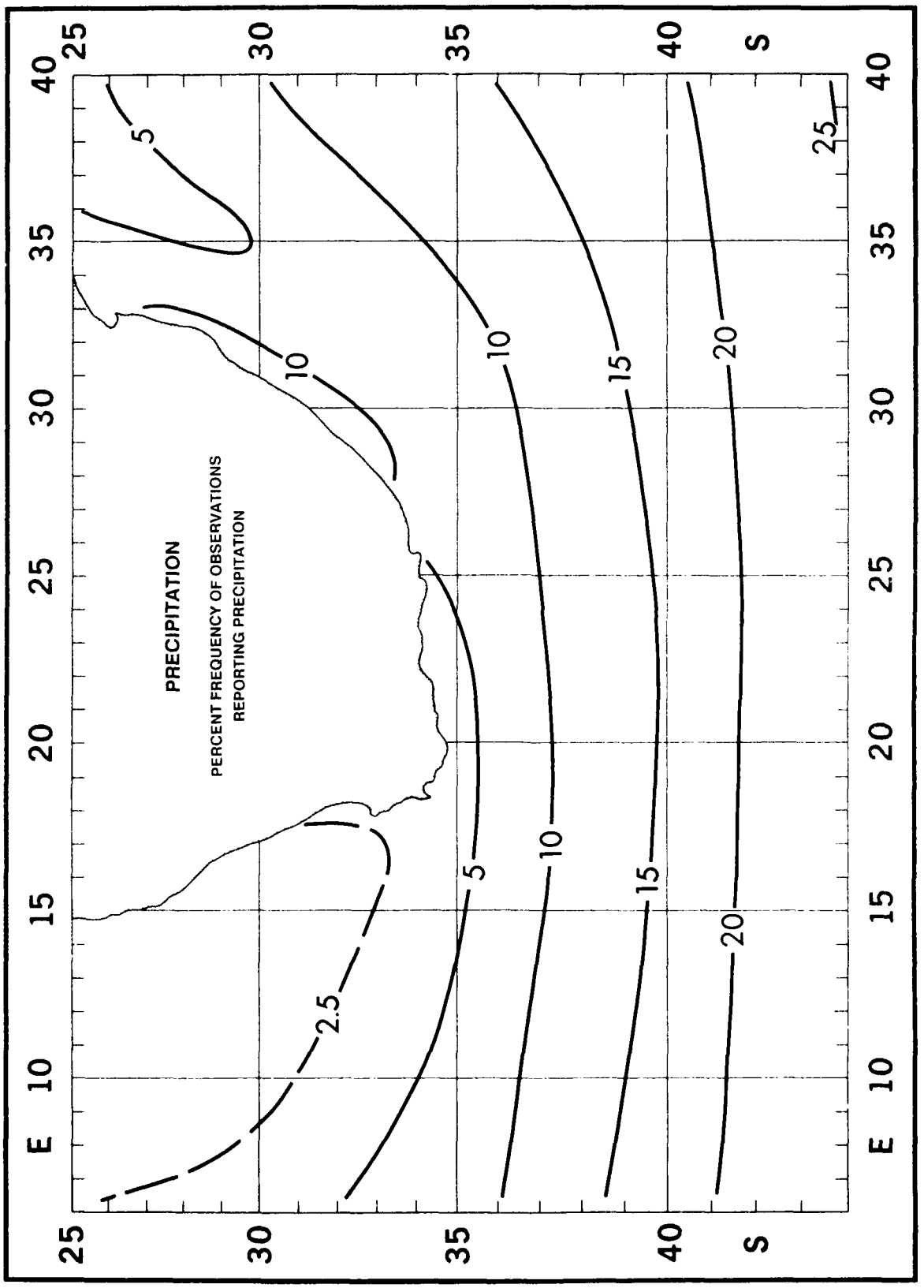
January

Surface Currents



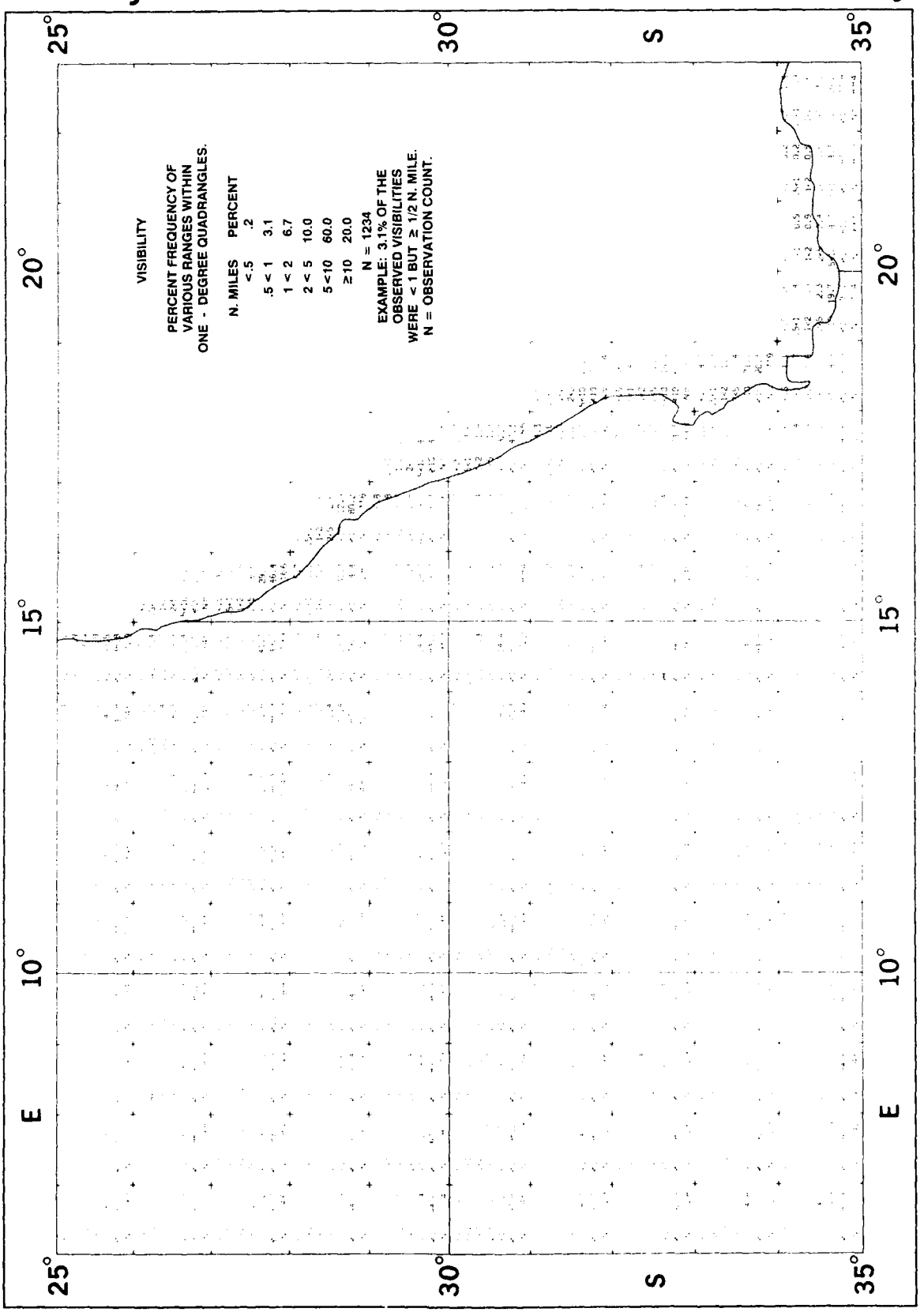

CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE - TOTAL CLOUD AMOUNT ≤2/8
DASHED LINE - LOW CLOUD AMOUNT ≥ 5/8
E
S
25
30
35
40
10
15
20
70
60
50
40
30
20

February **Precipitation**

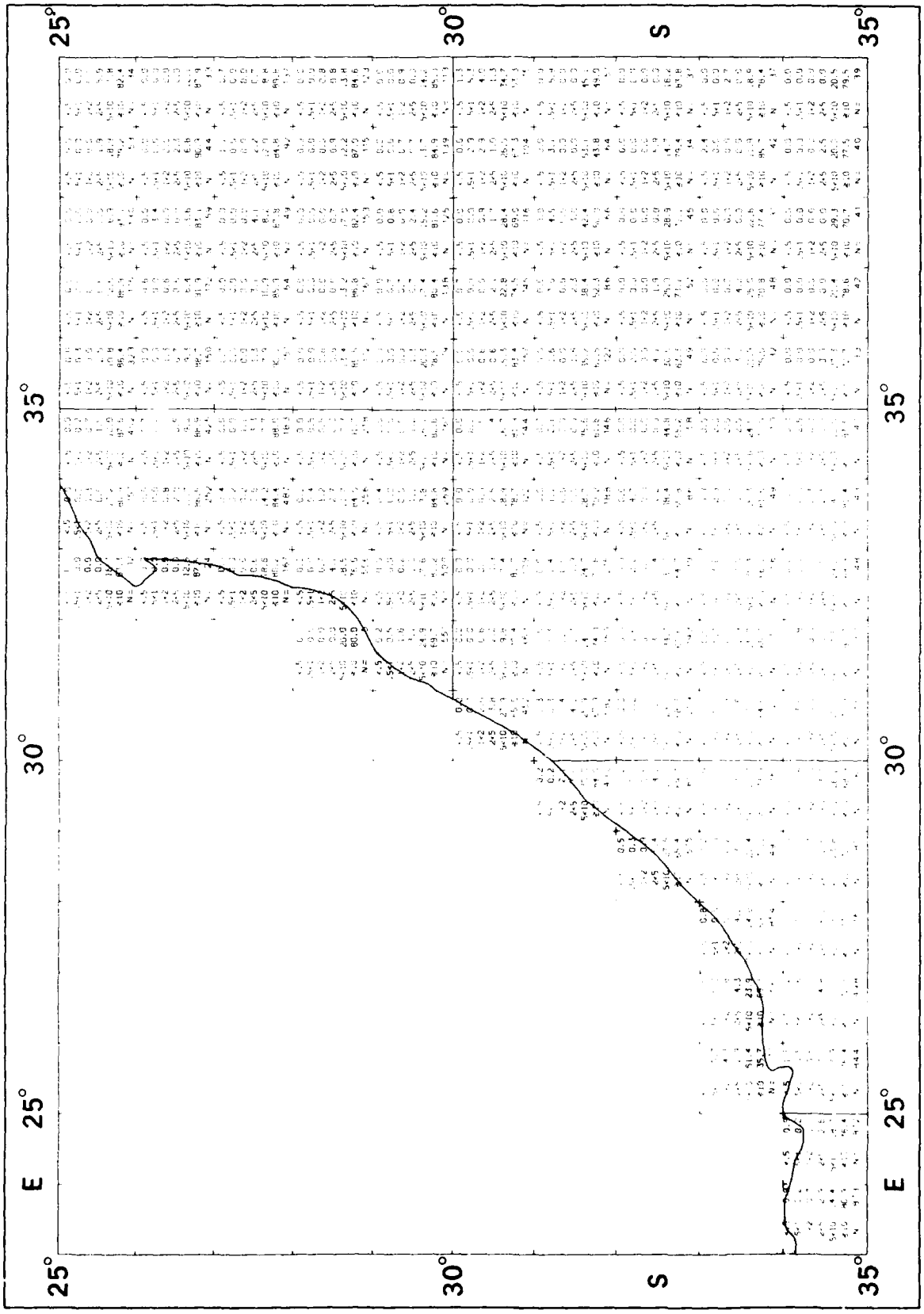


February

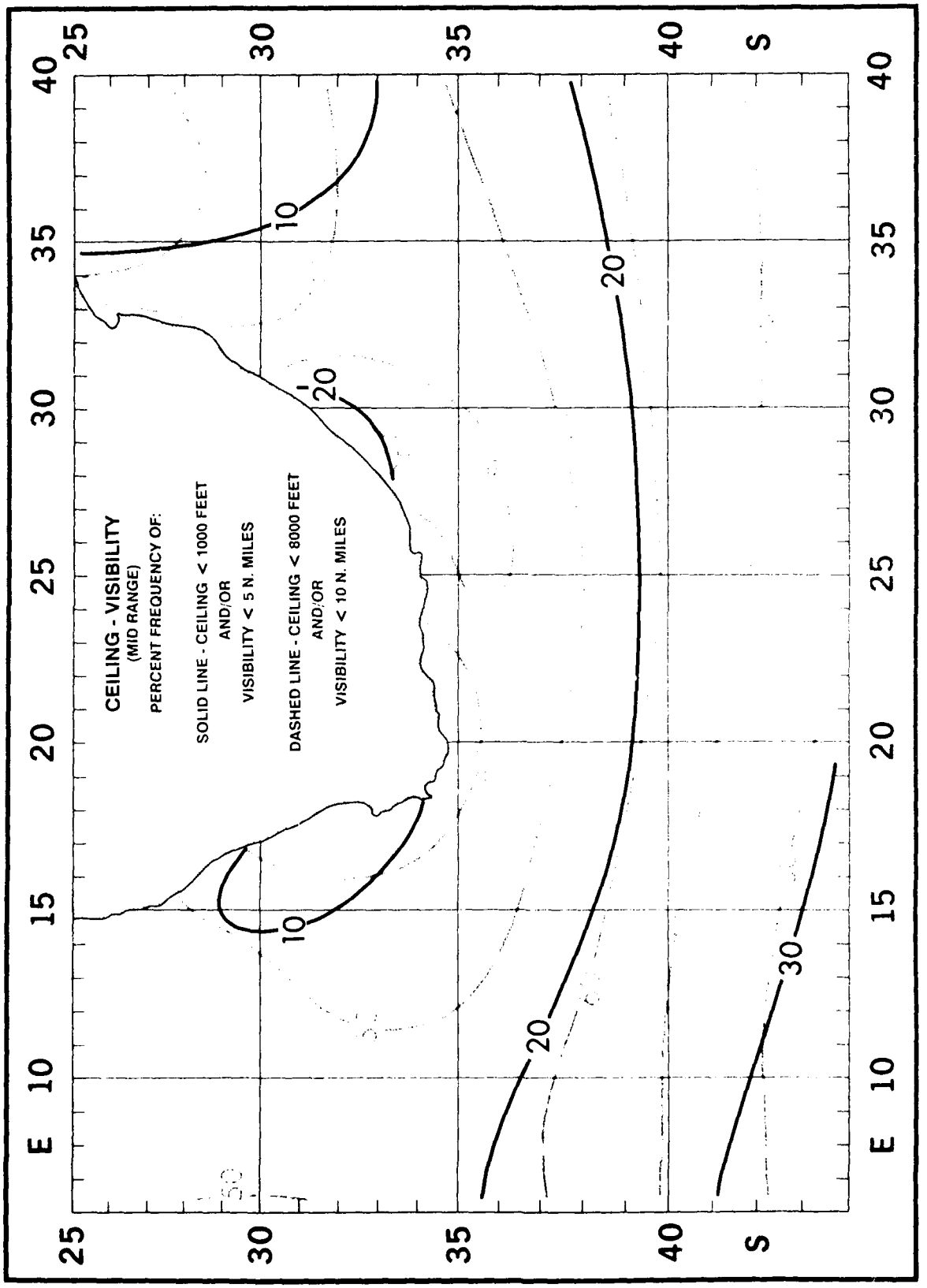
Visibility



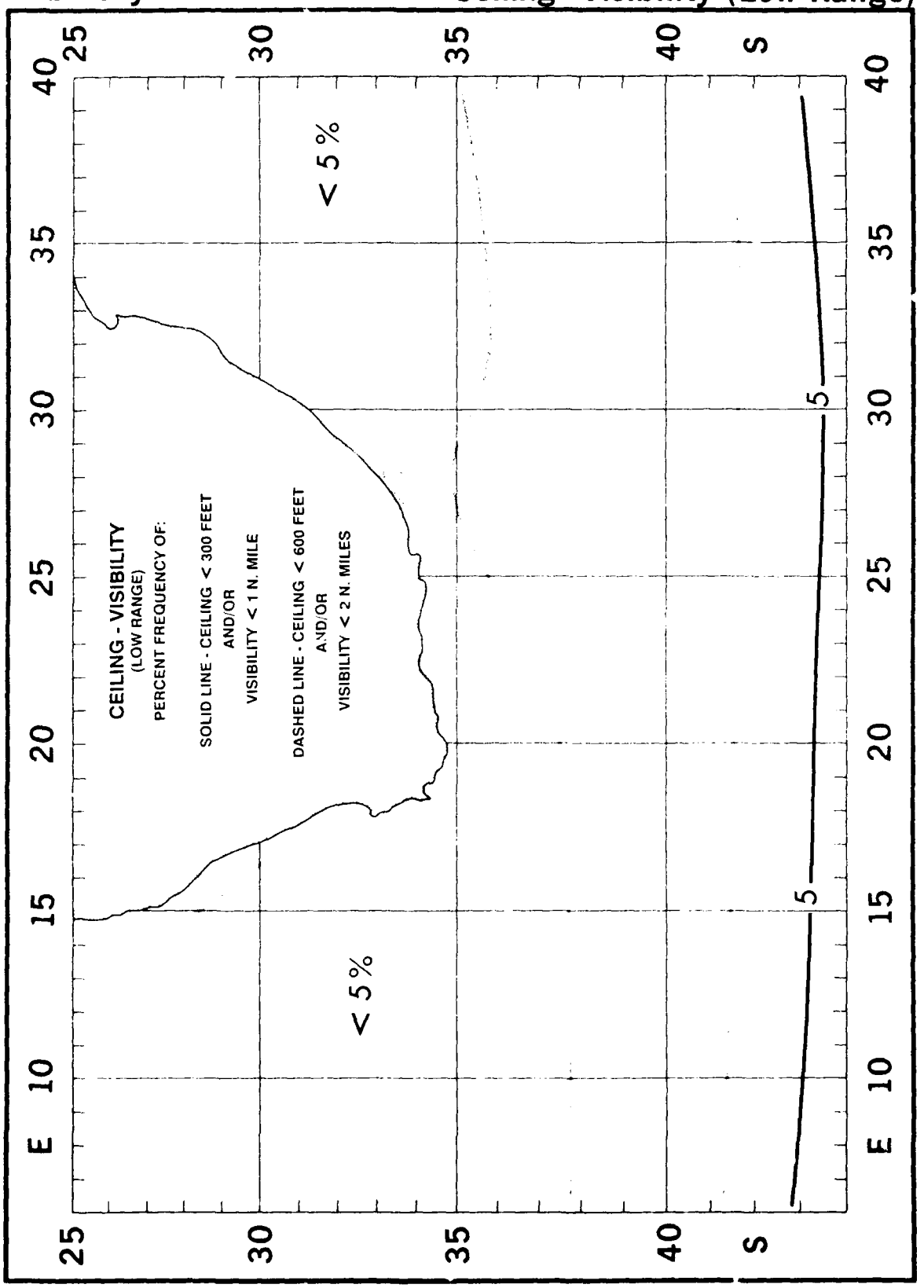
February **Visibility**



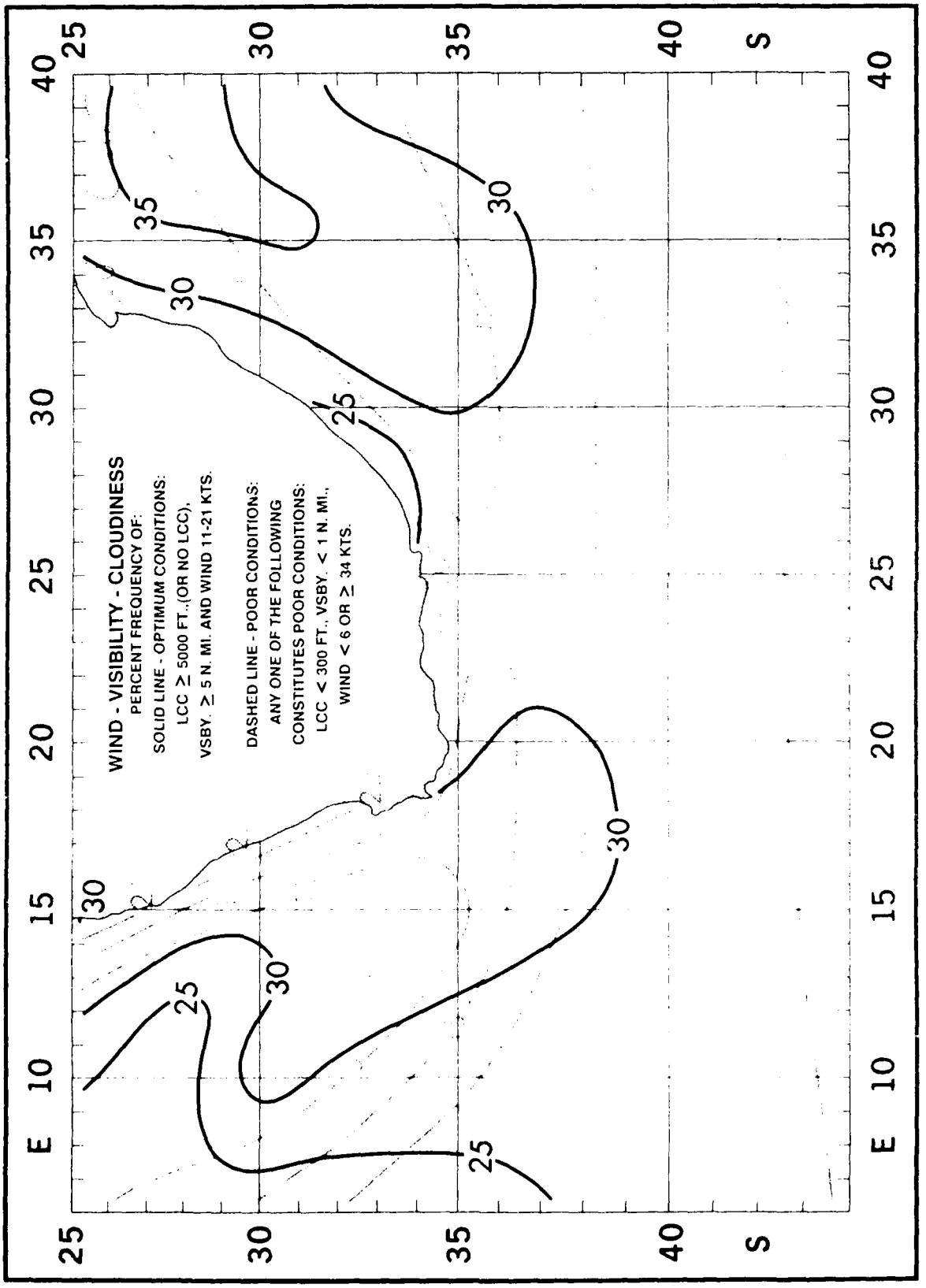
February **Ceiling - Visibility (Mid Range)**



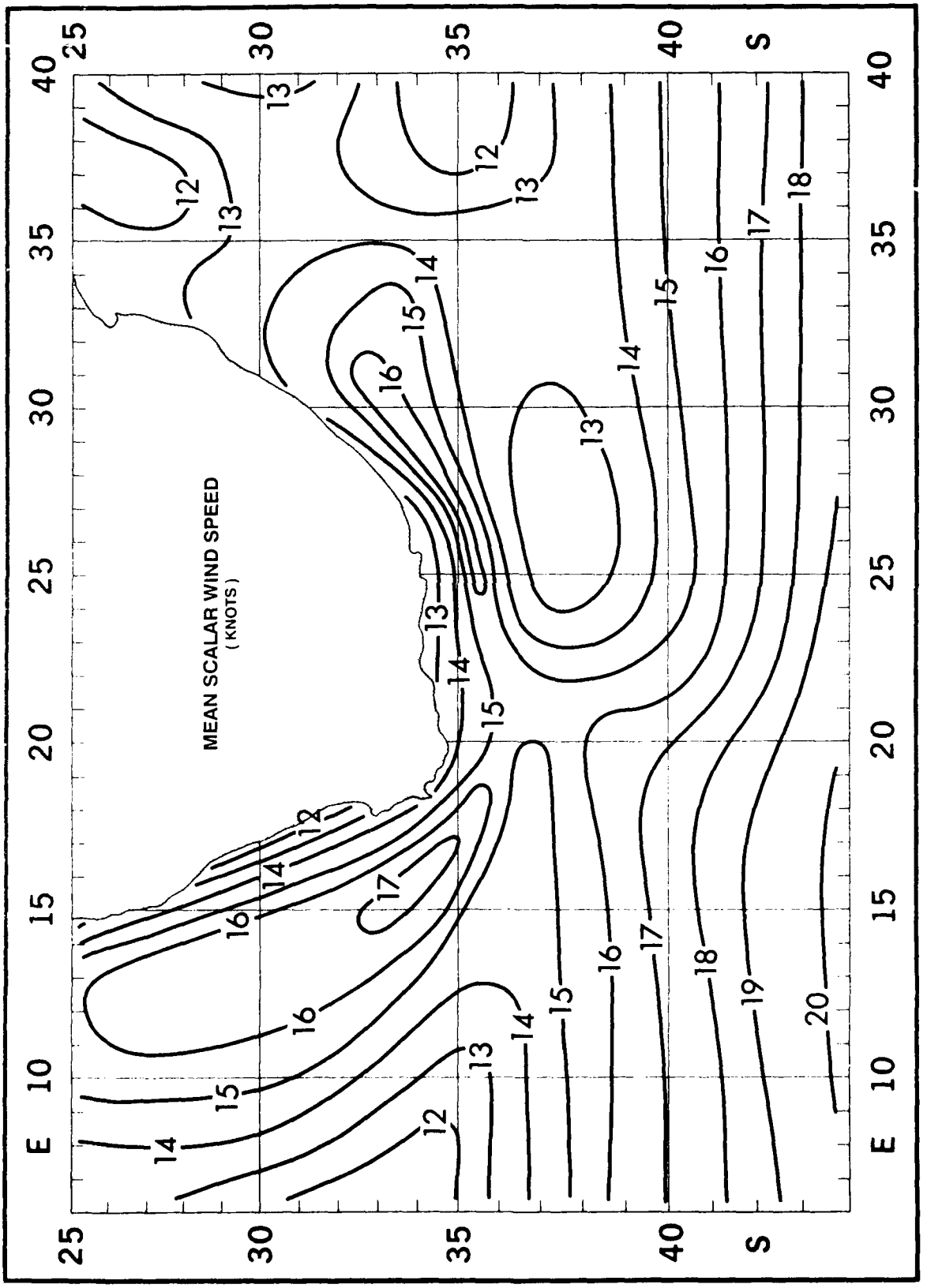
February **Ceiling - Visibility (Low Range)**



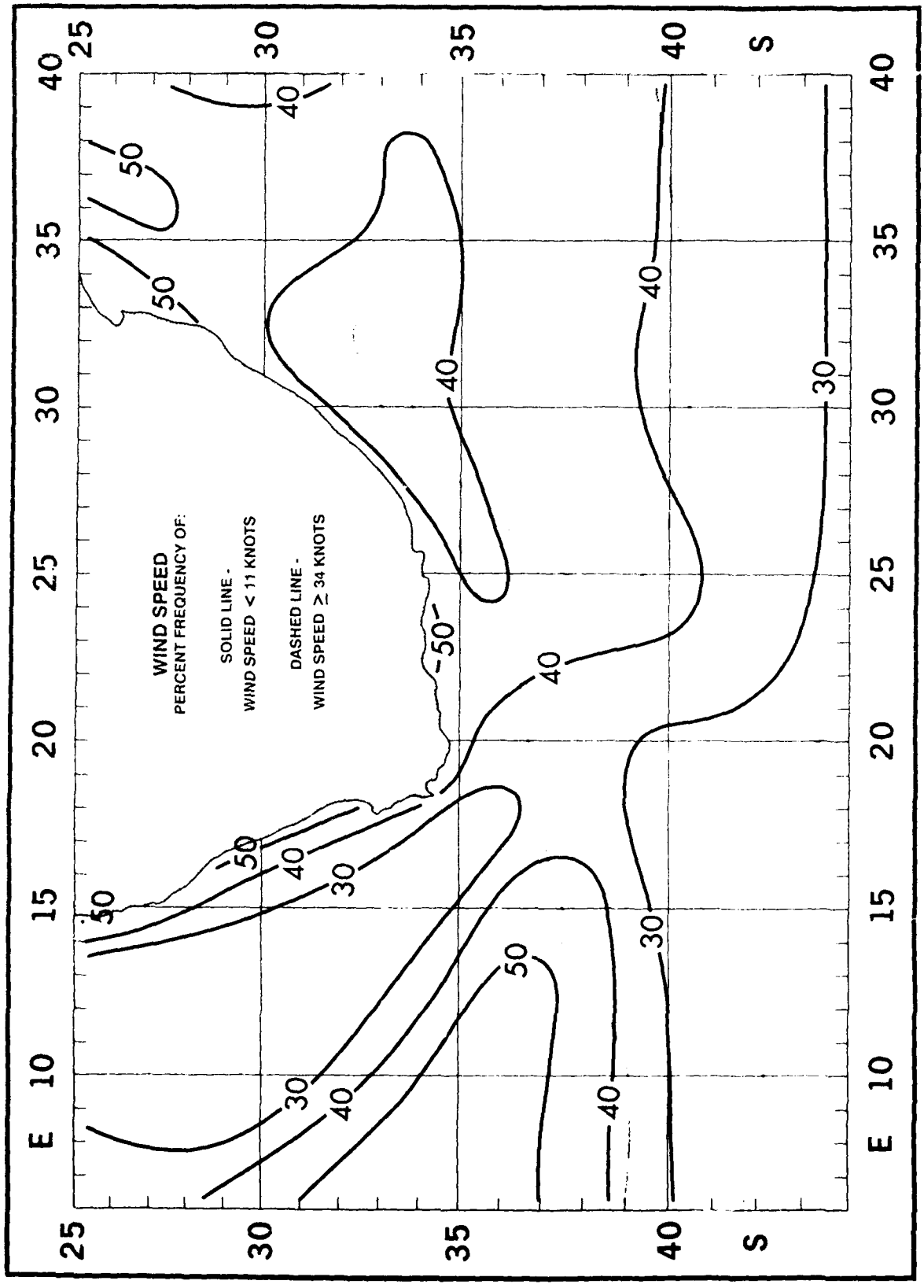
February **Wind · Visibility · Cloudiness**



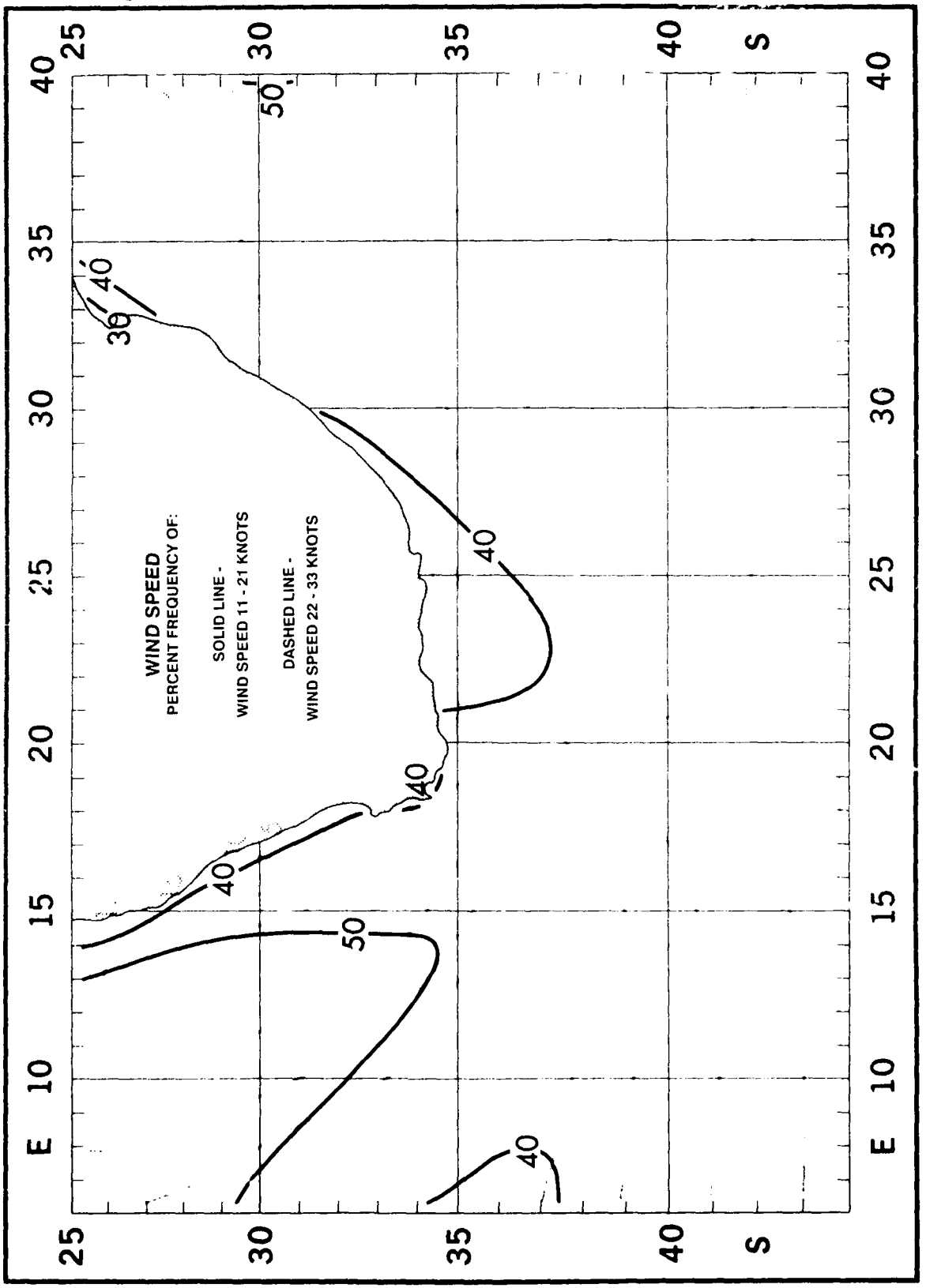
February **Mean Scalar Wind Speed**



February **Wind Speed <11 and ≥34 Knots**

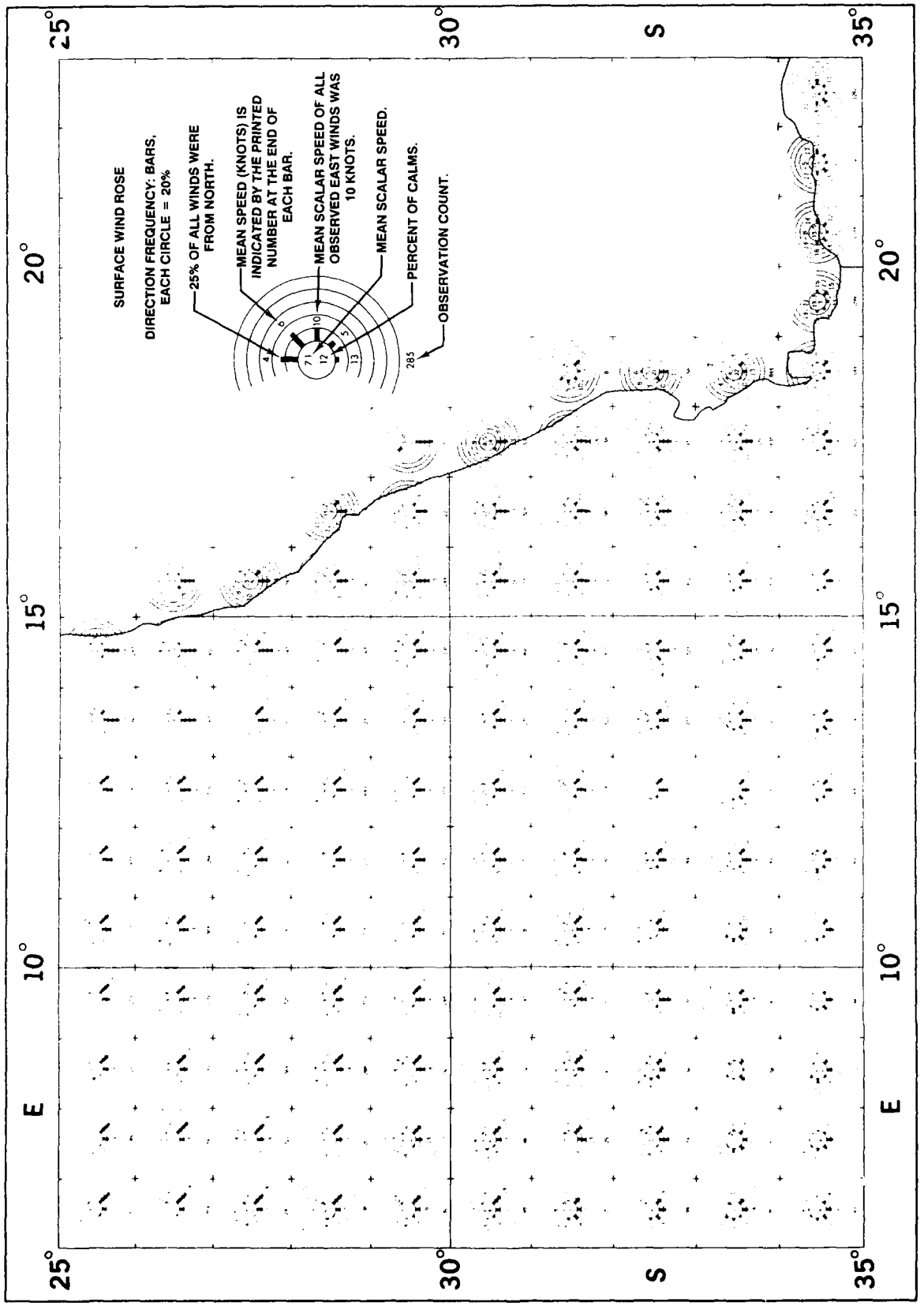


February **Wind Speed 11 - 21 and 22 - 33 Knots**

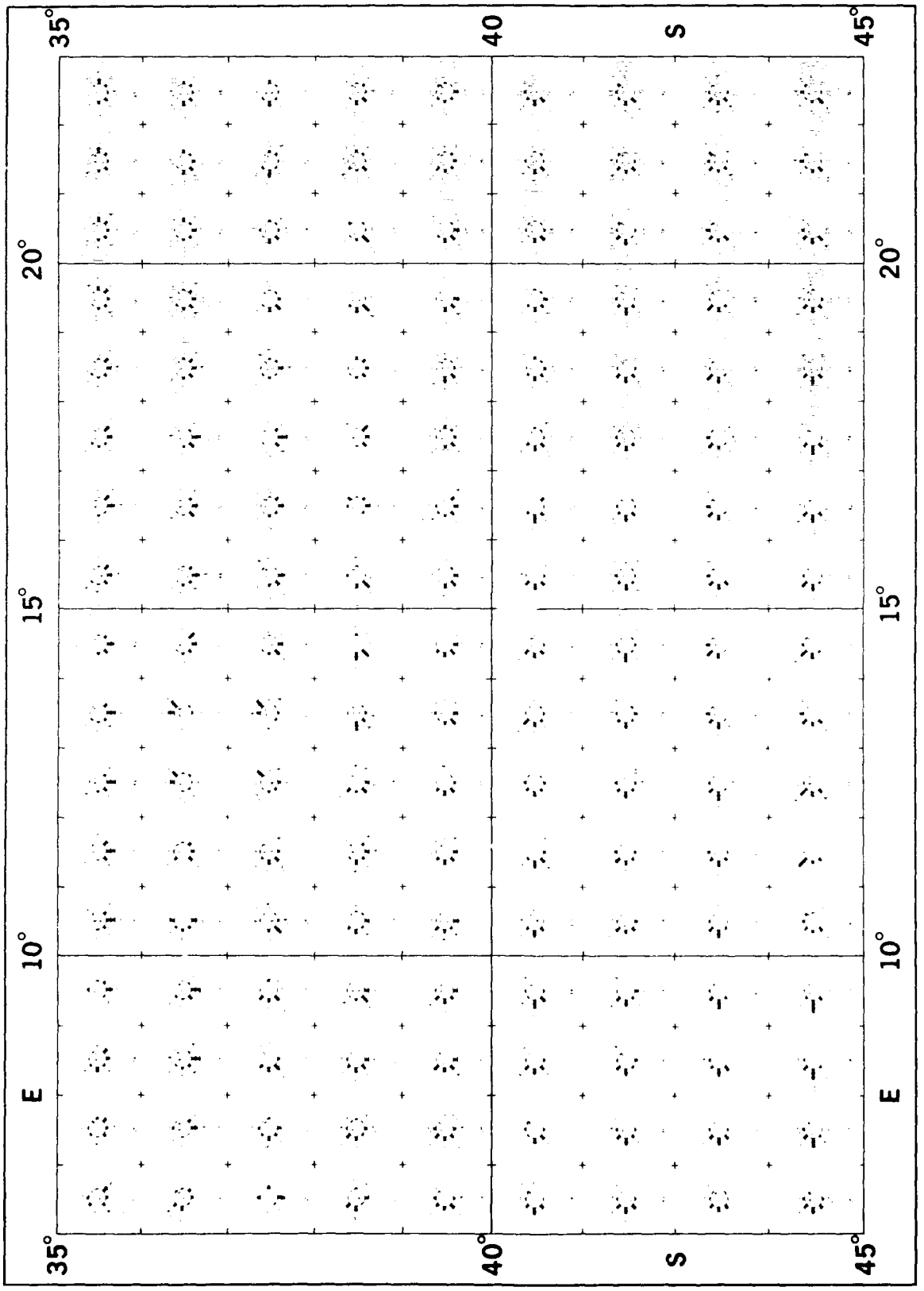


February

Surface Wind Roses

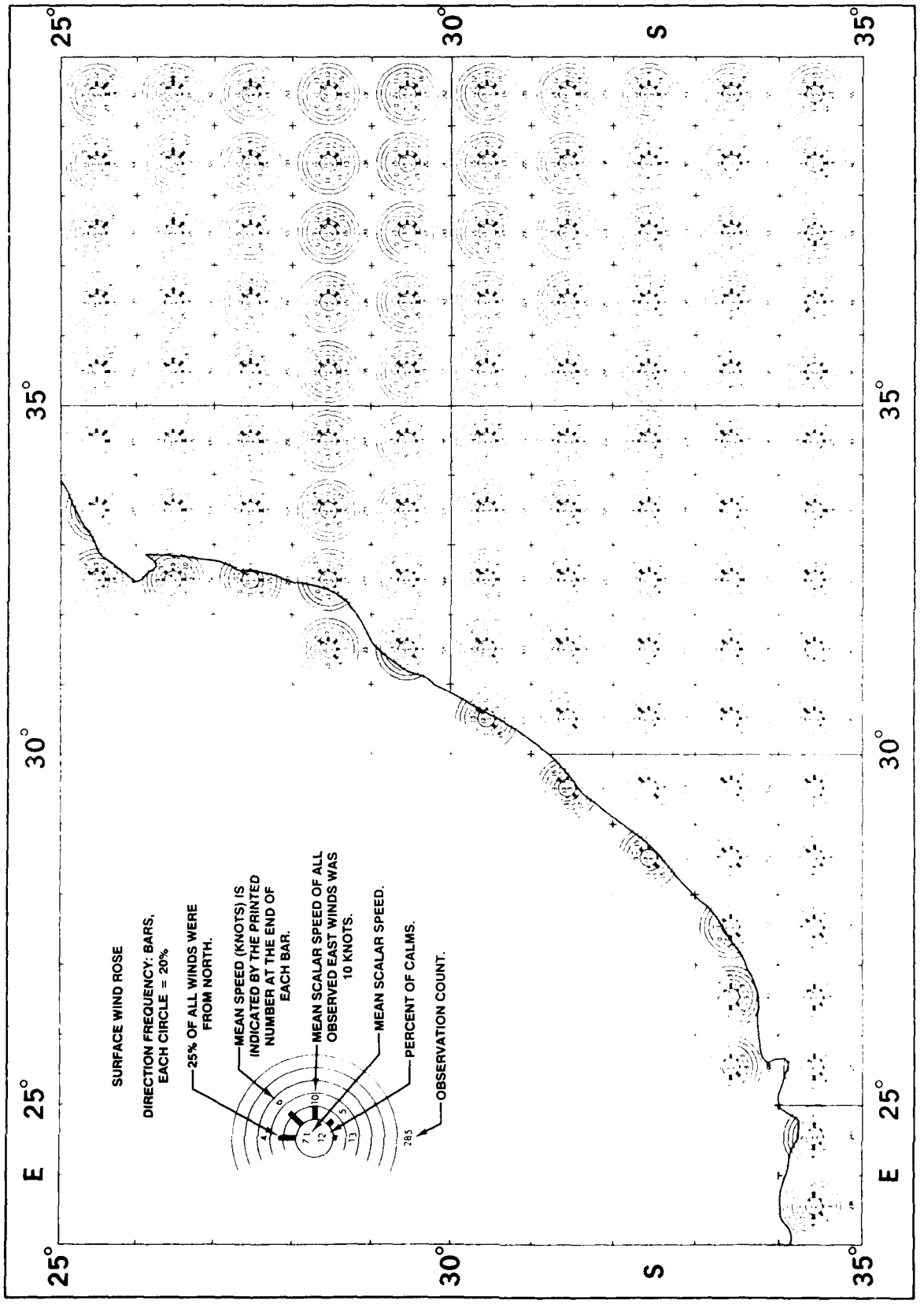


February **Surface Wind Roses**



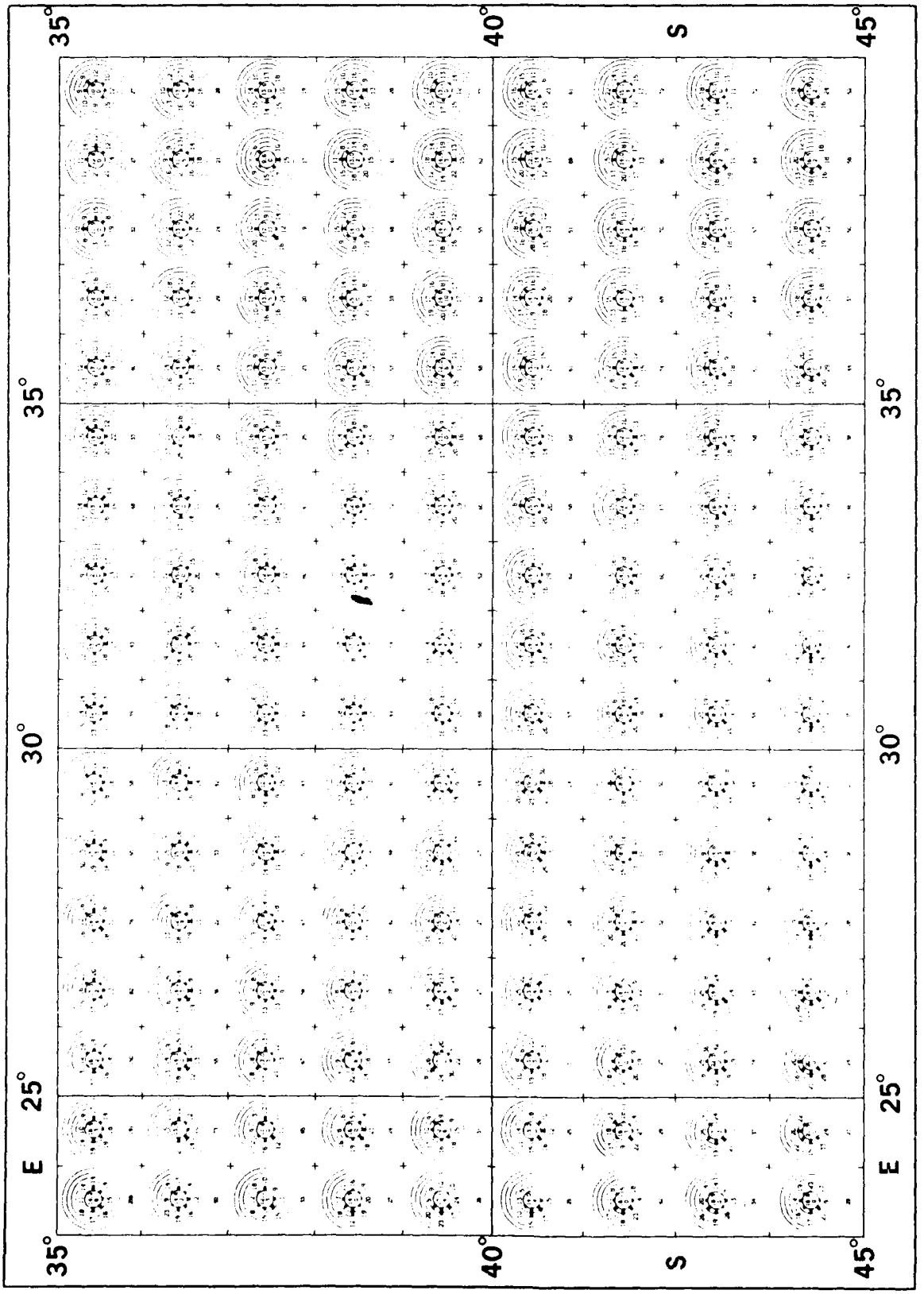
February

Surface Wind Roses

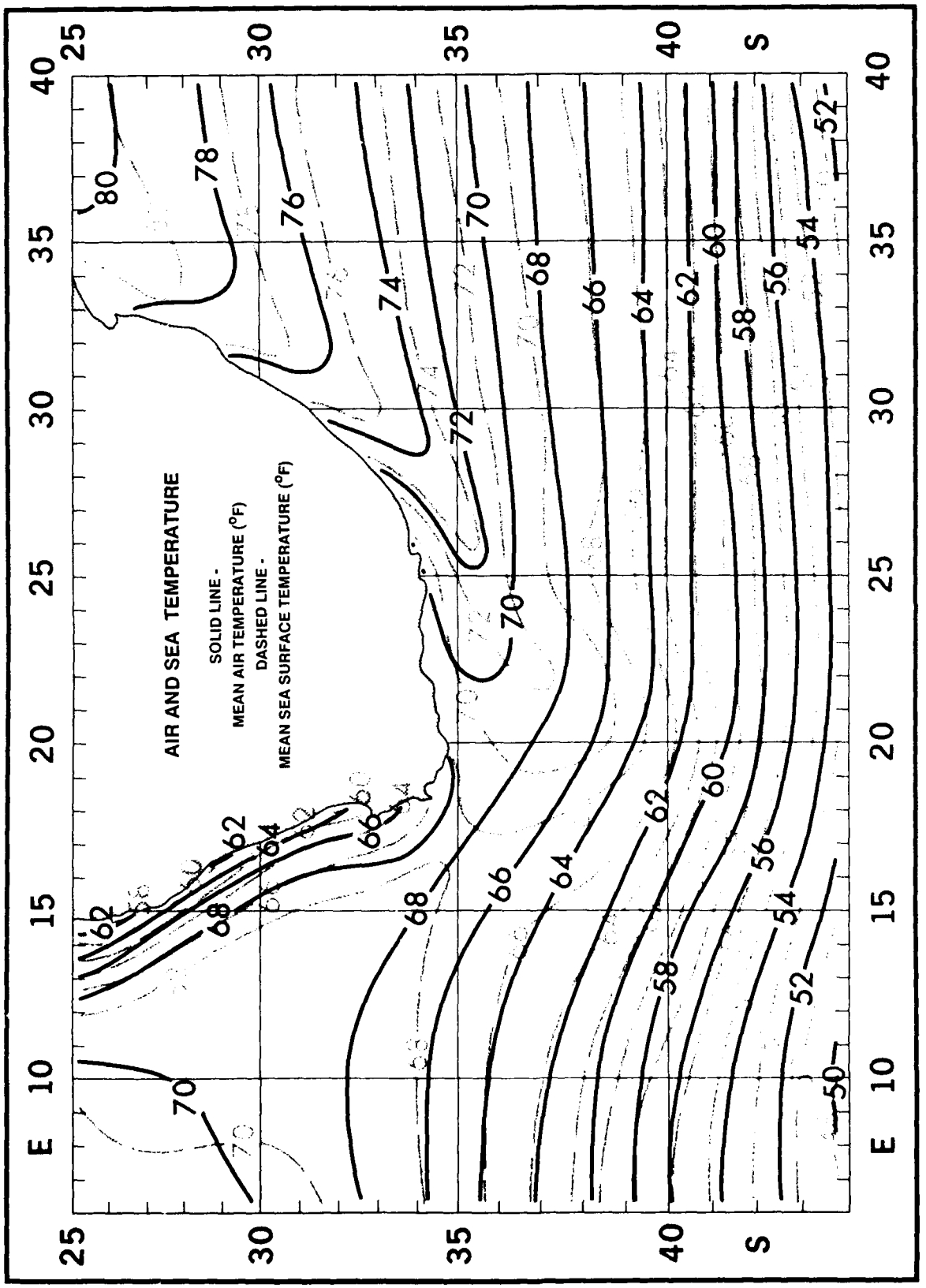


February

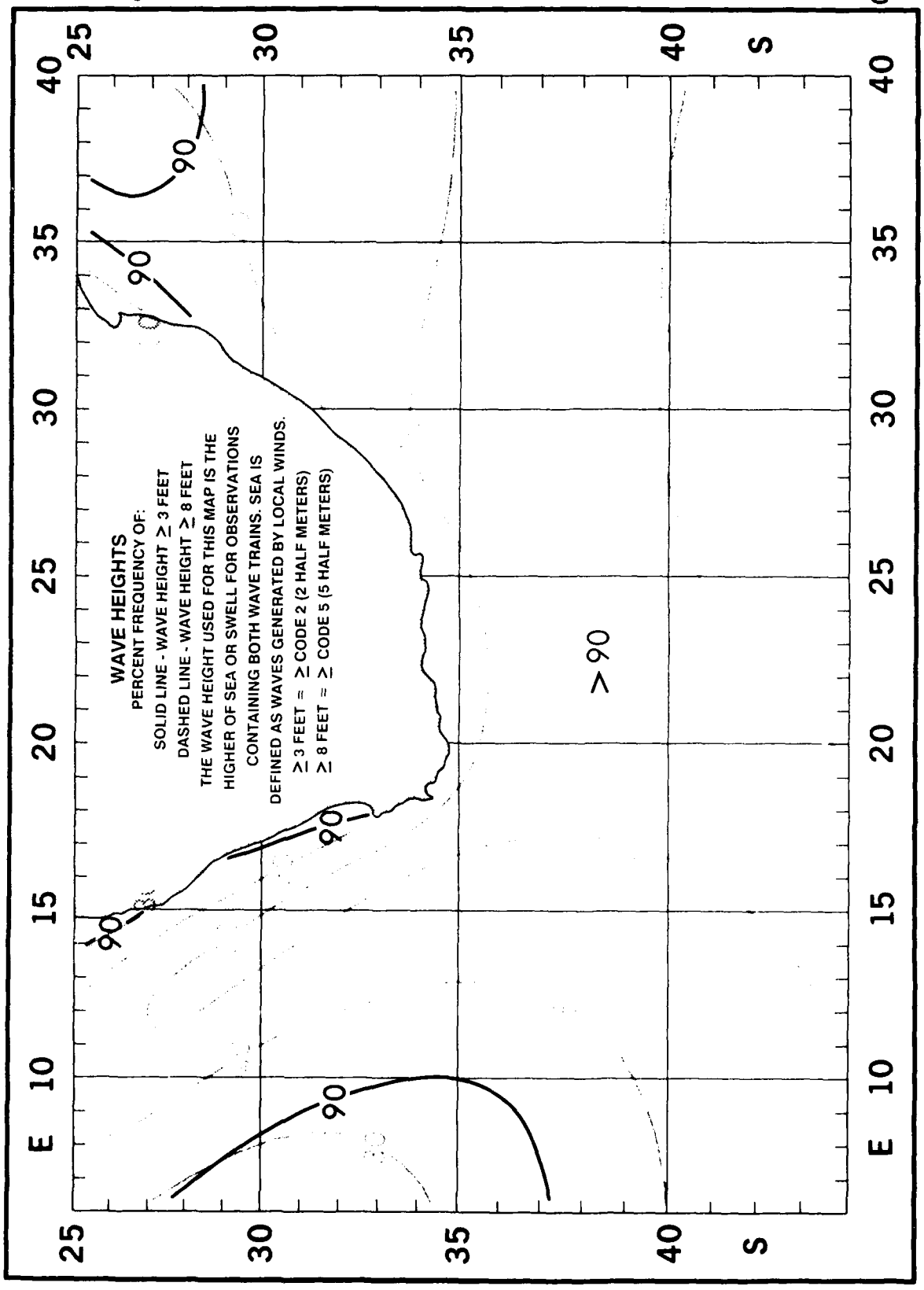
Surface Wind Roses



February **Air and Sea Temperature**

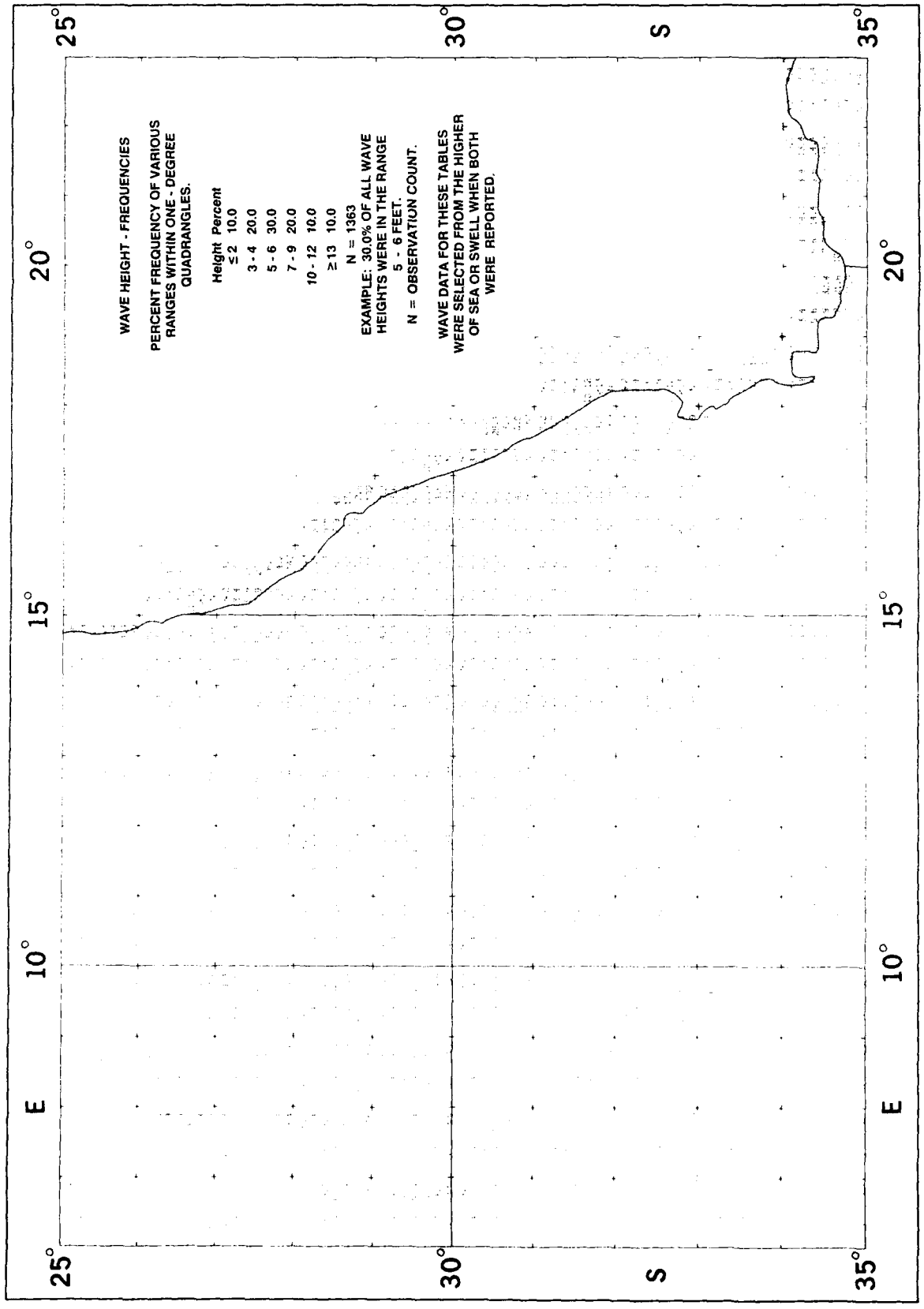


February **Wave Height**

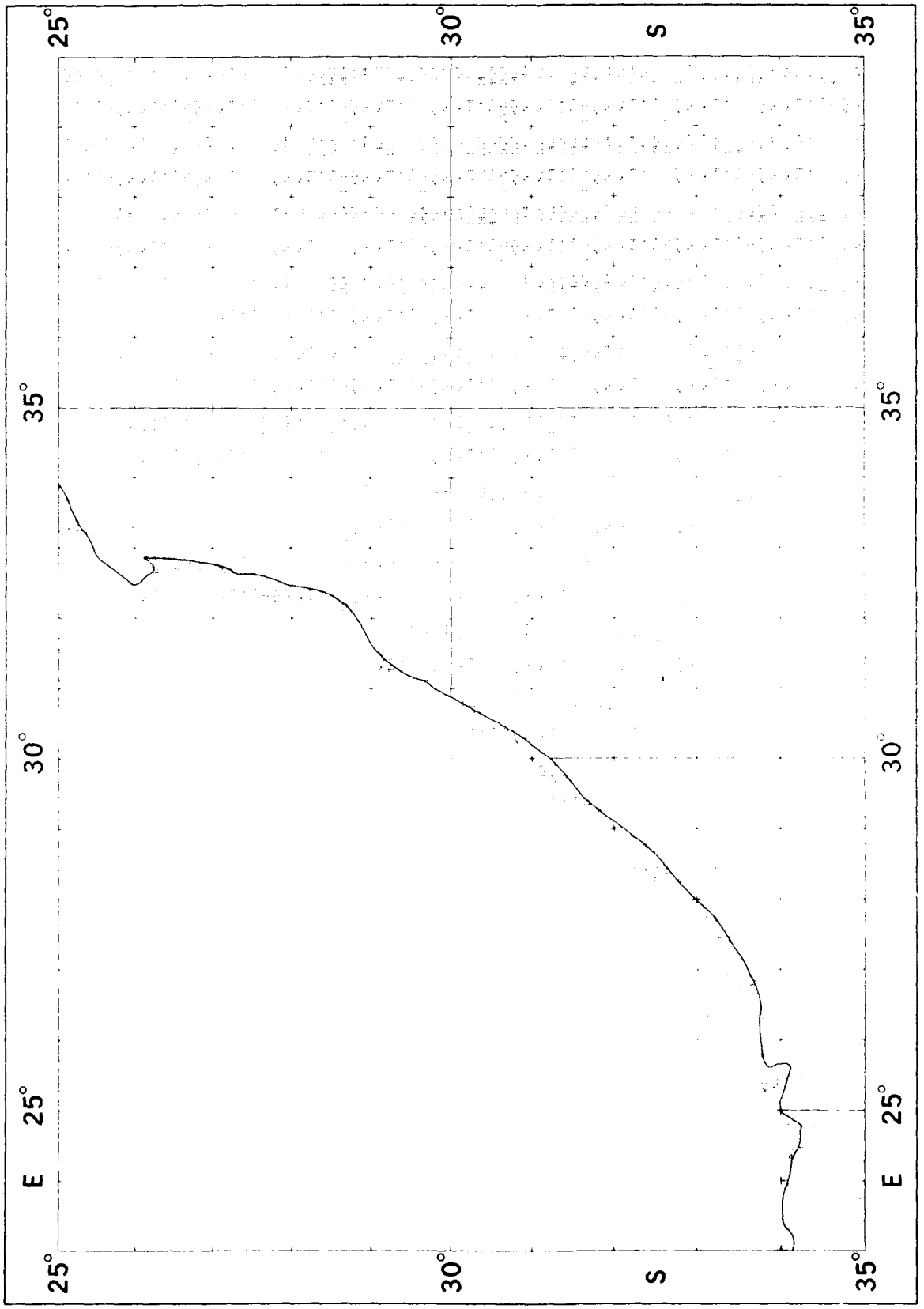


February

Wave Height

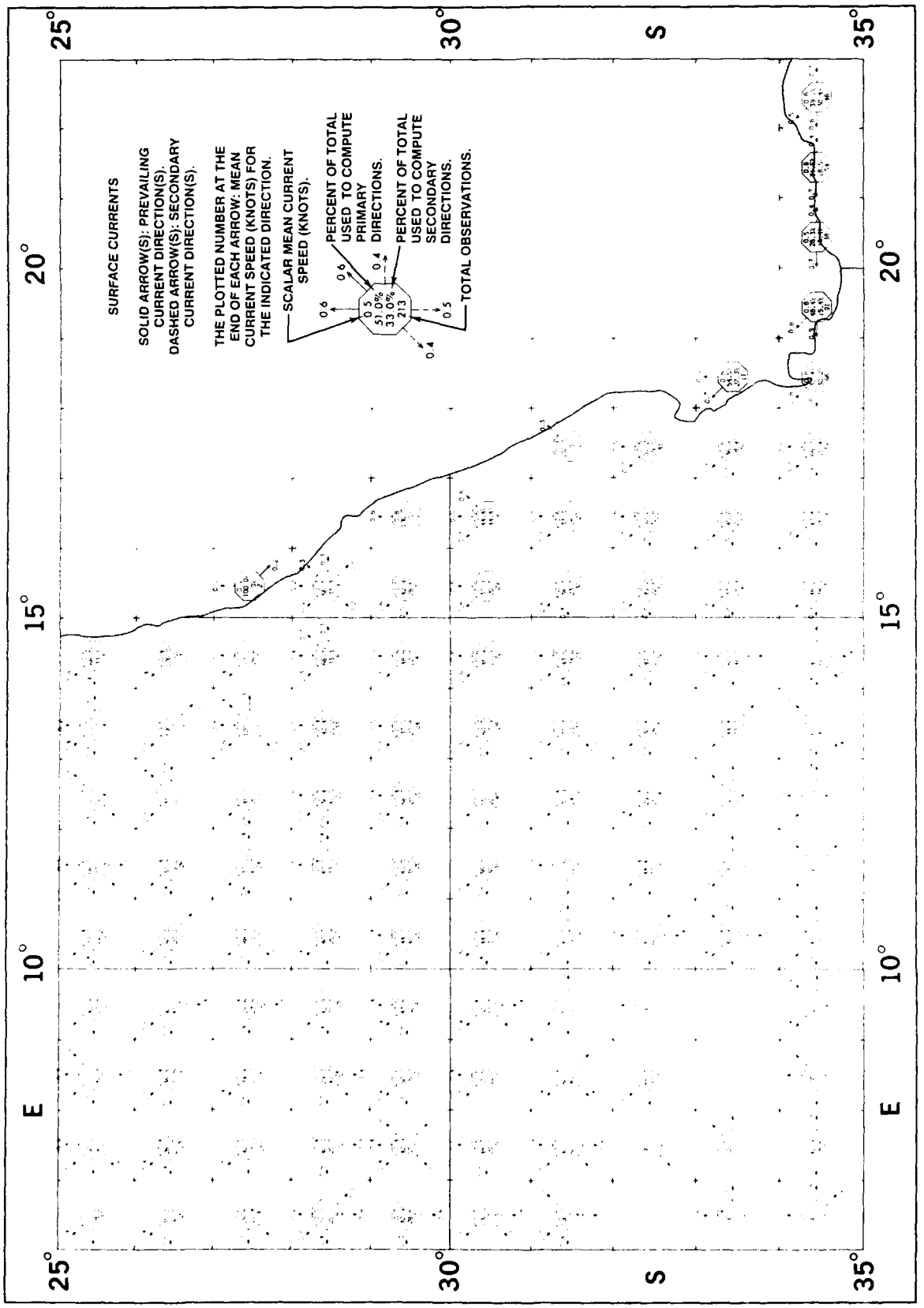


February **Wave Height**

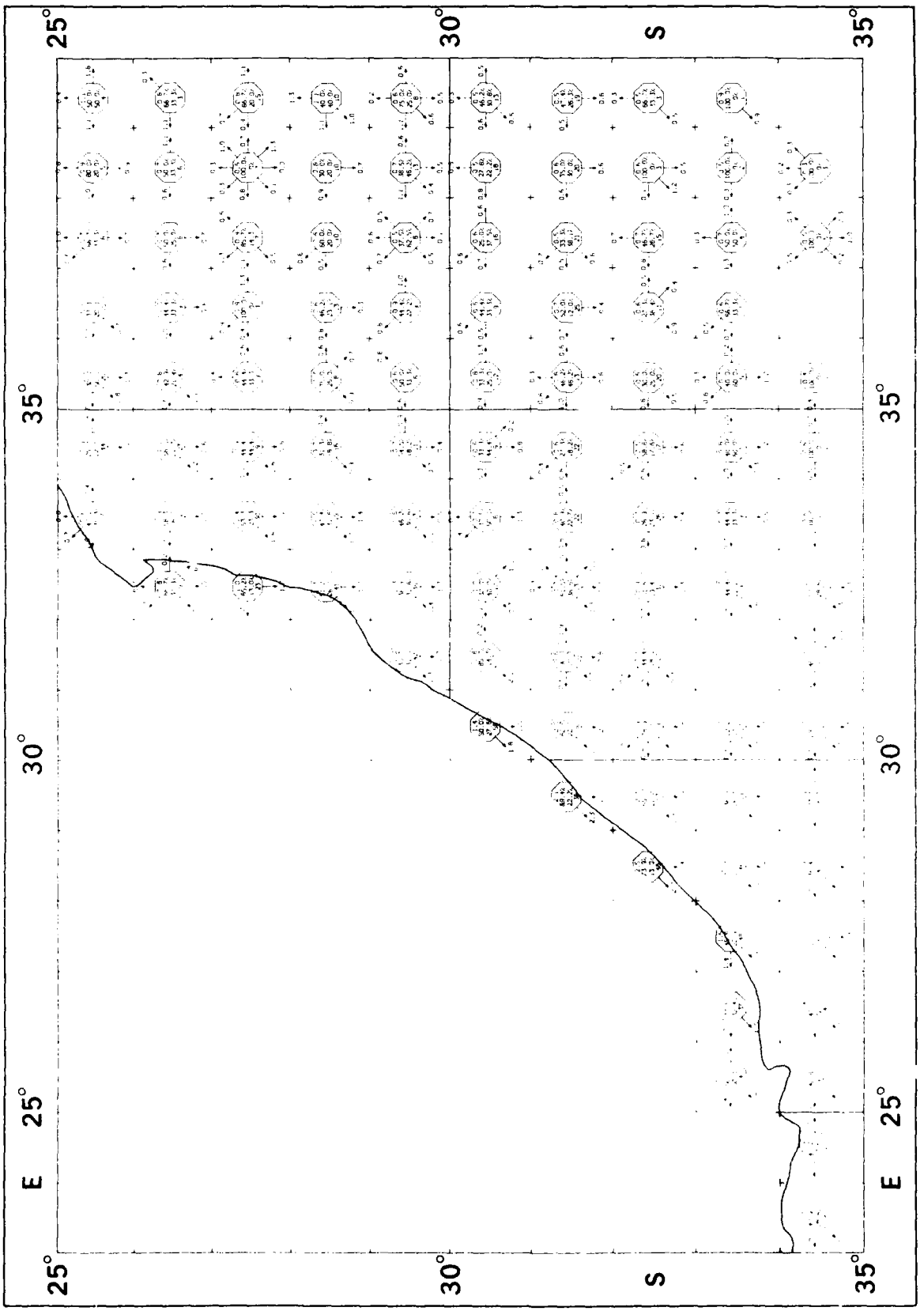


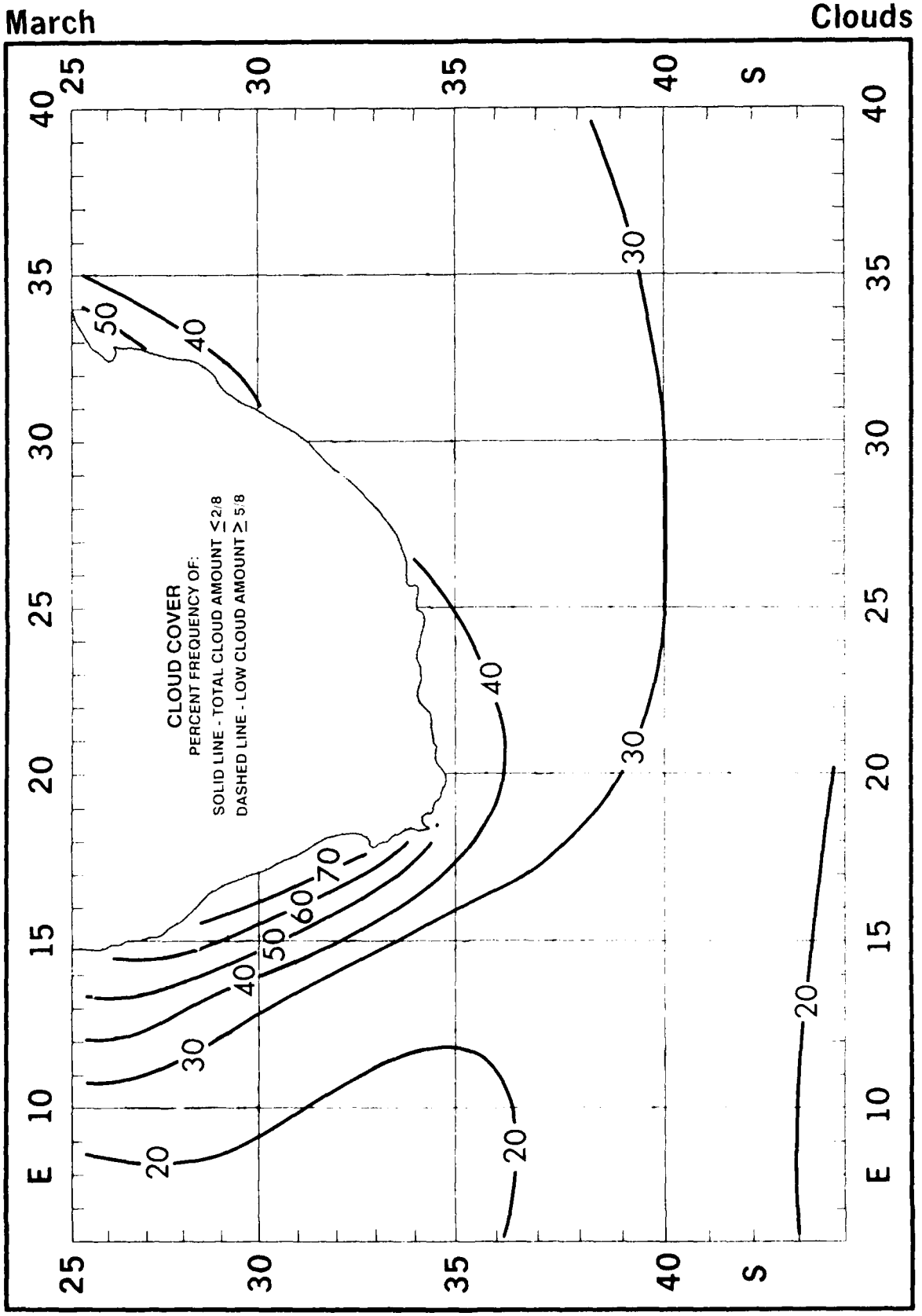
February

Surface Currents



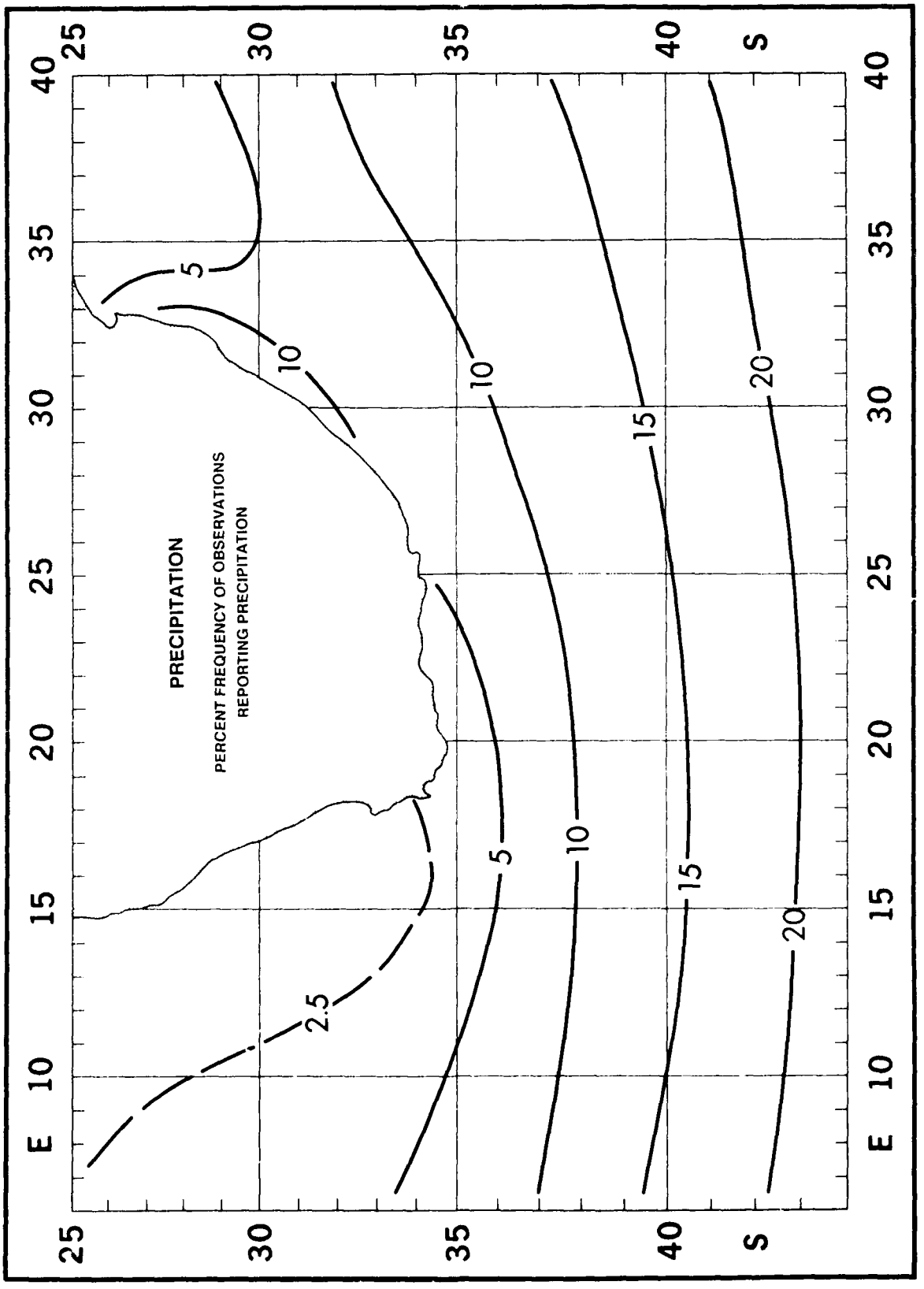
February **Surface Currents**




March
Clouds
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE - TOTAL CLOUD AMOUNT ≤ 2/8
DASHED LINE - LOW CLOUD AMOUNT ≥ 5/8
25
30
35
40
S
E
10
15
20
50
40
30
20
70
60

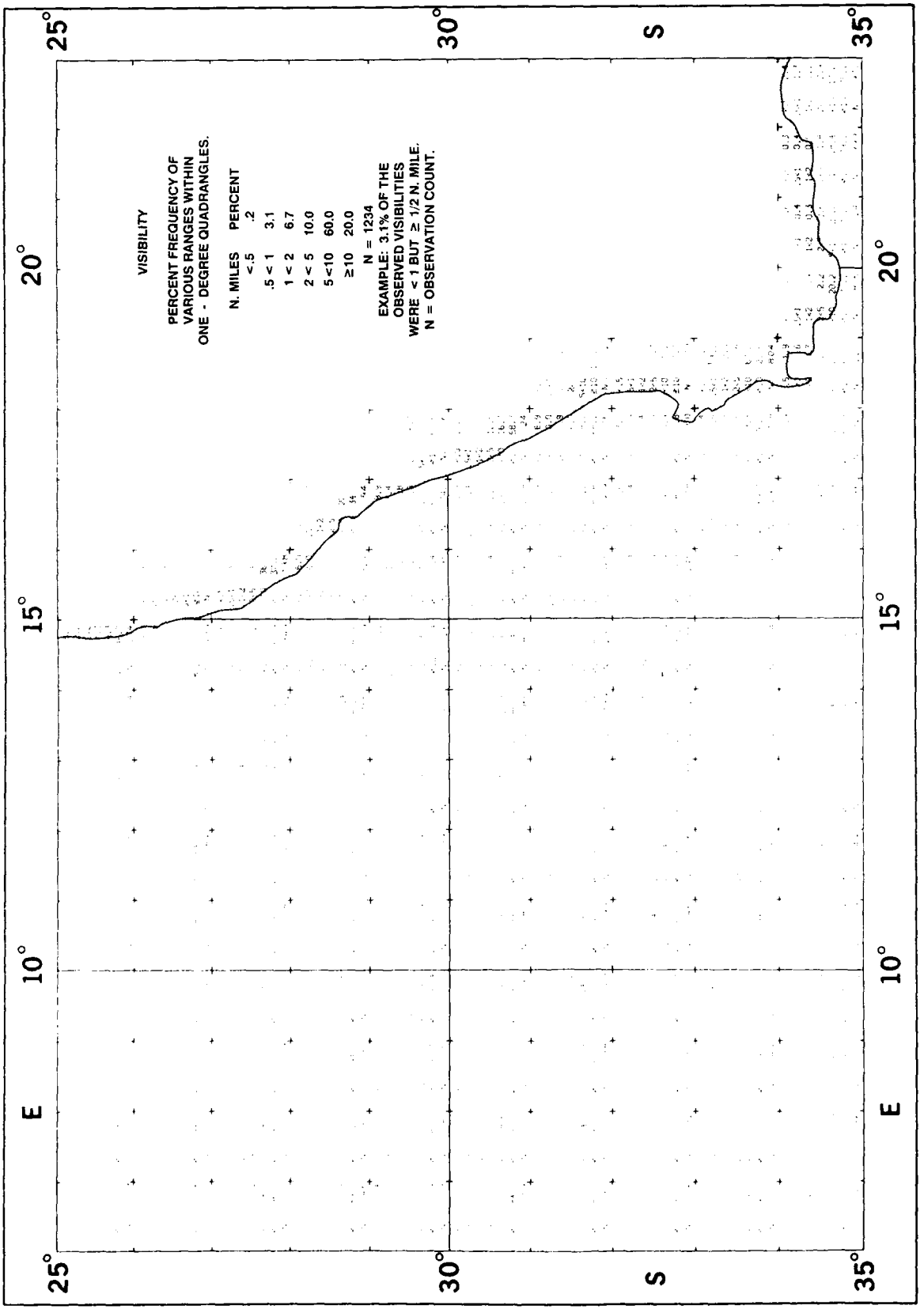
March

Precipitation

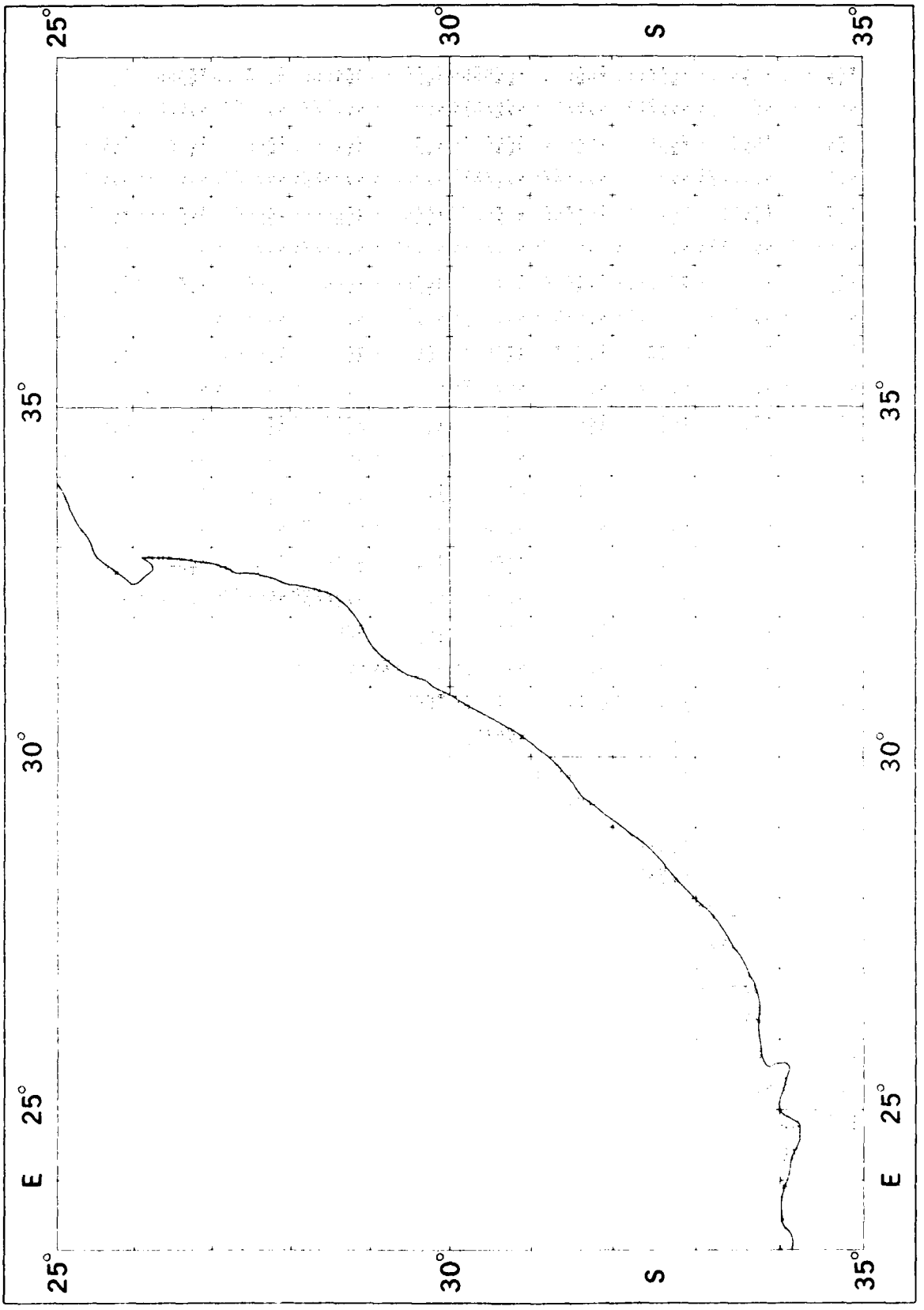


March

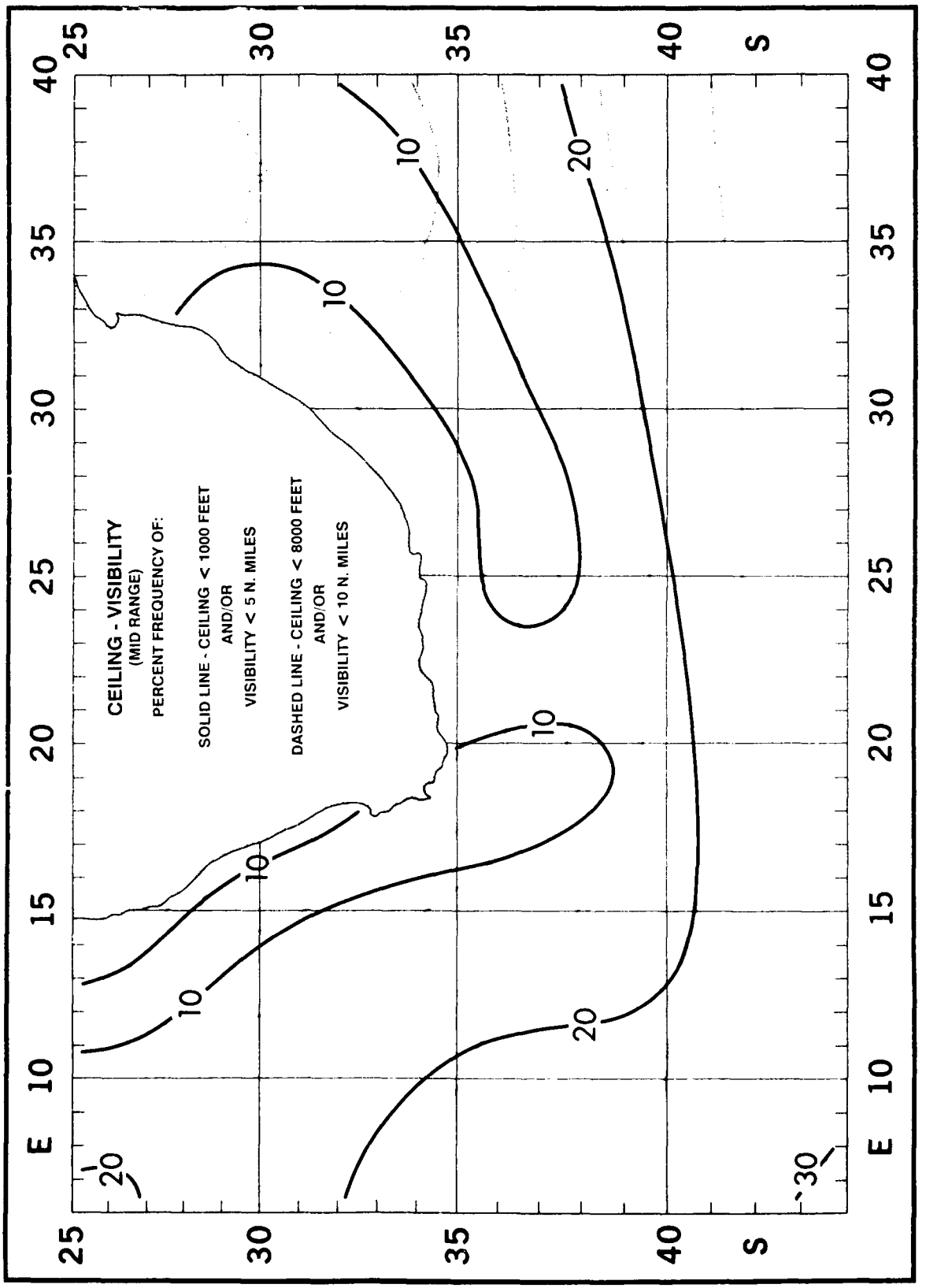
Visibility



March **Visibility**

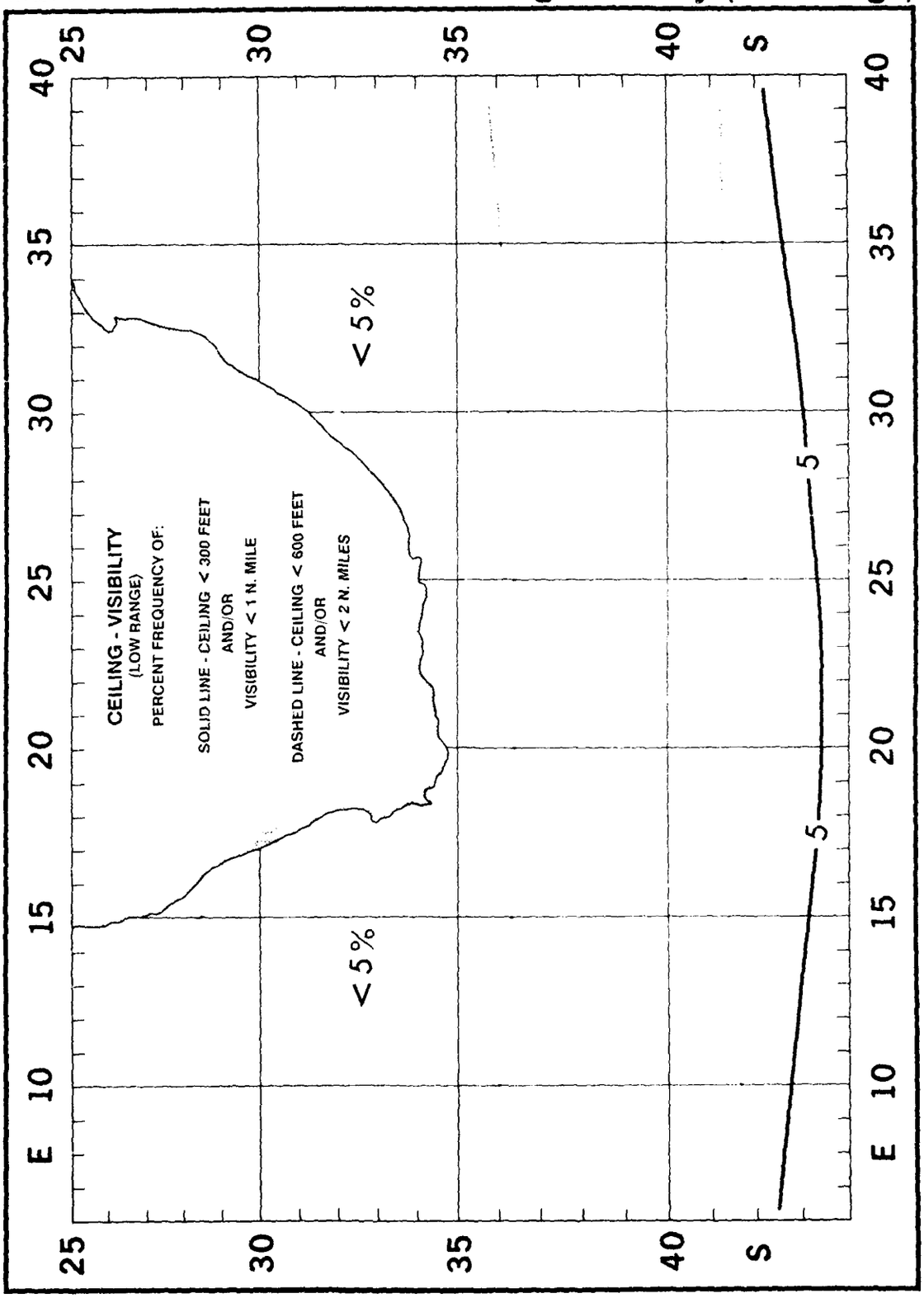


March **Ceiling - Visibility (Mid Range)**



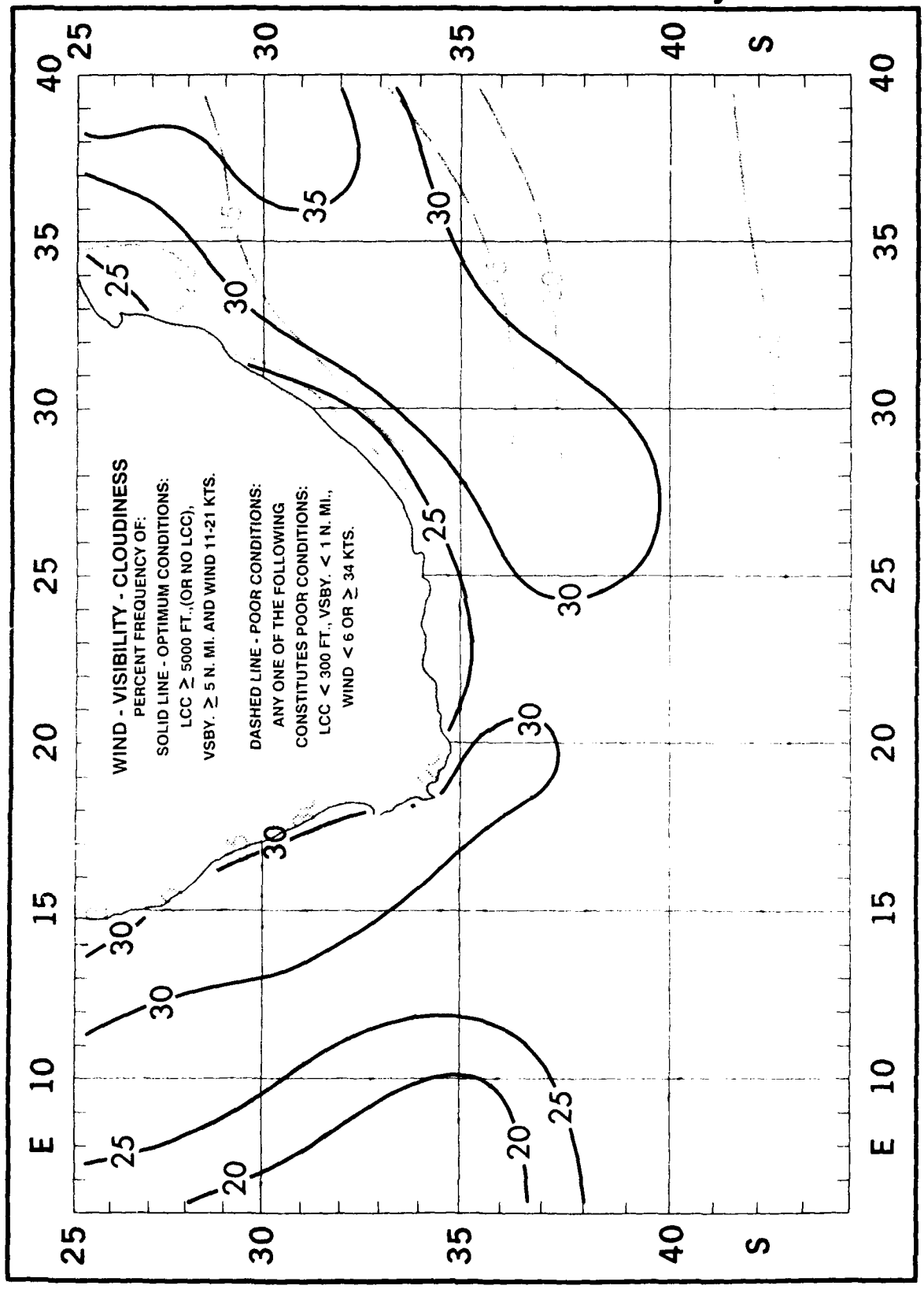
March

Ceiling - Visibility (Low Range)

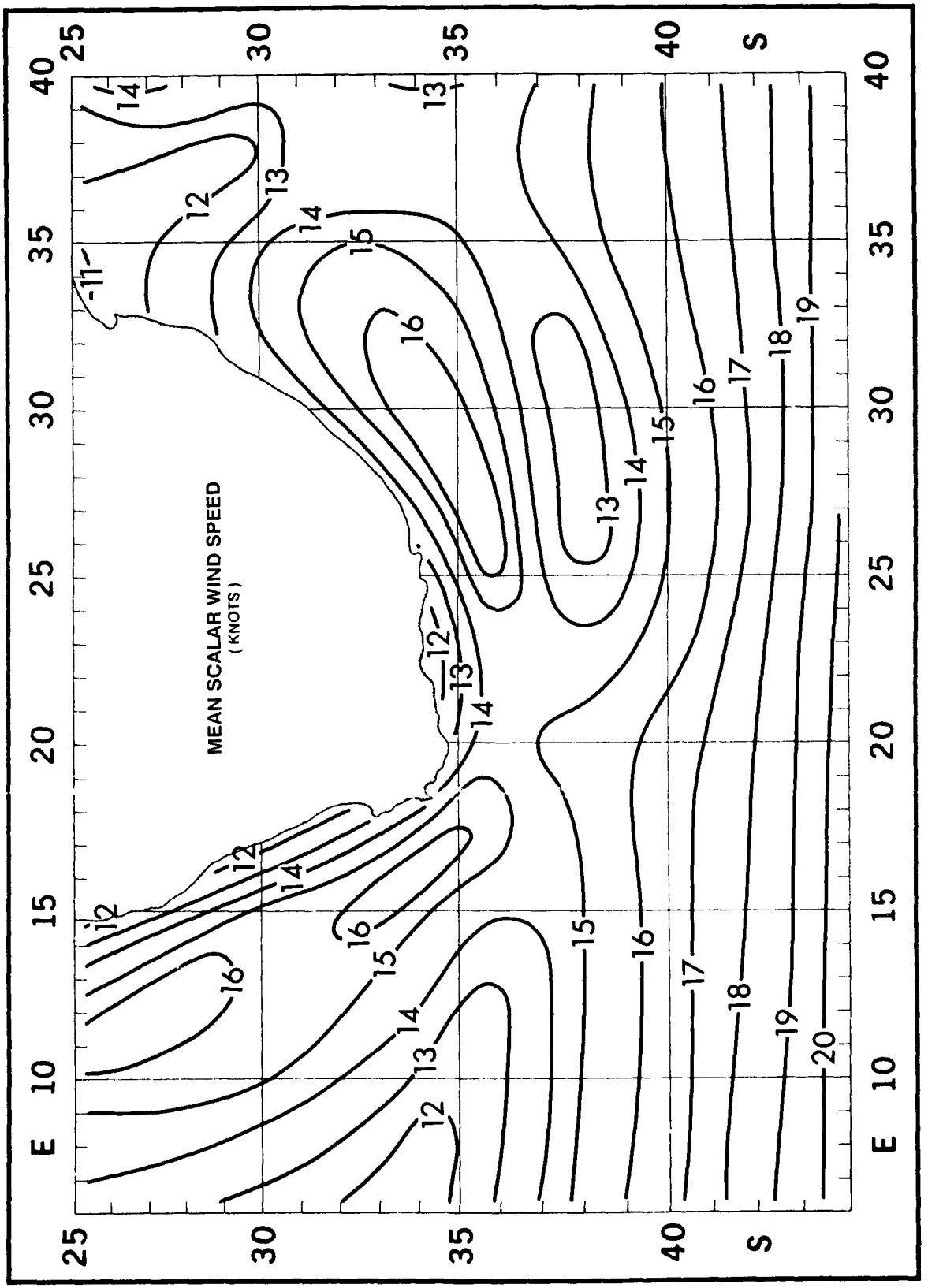


March

Wind - Visibility - Cloudiness

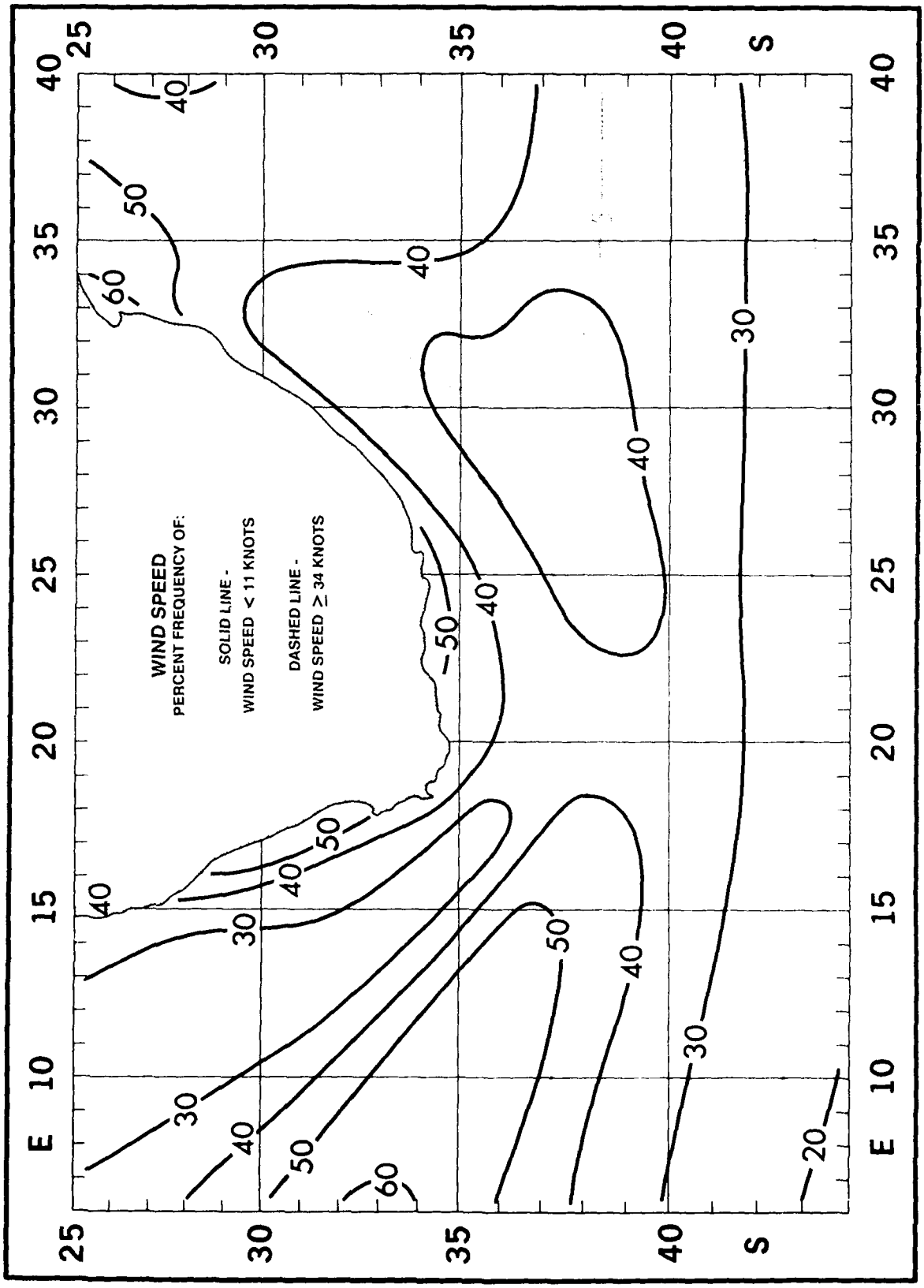


March **Mean Scalar Wind Speed**

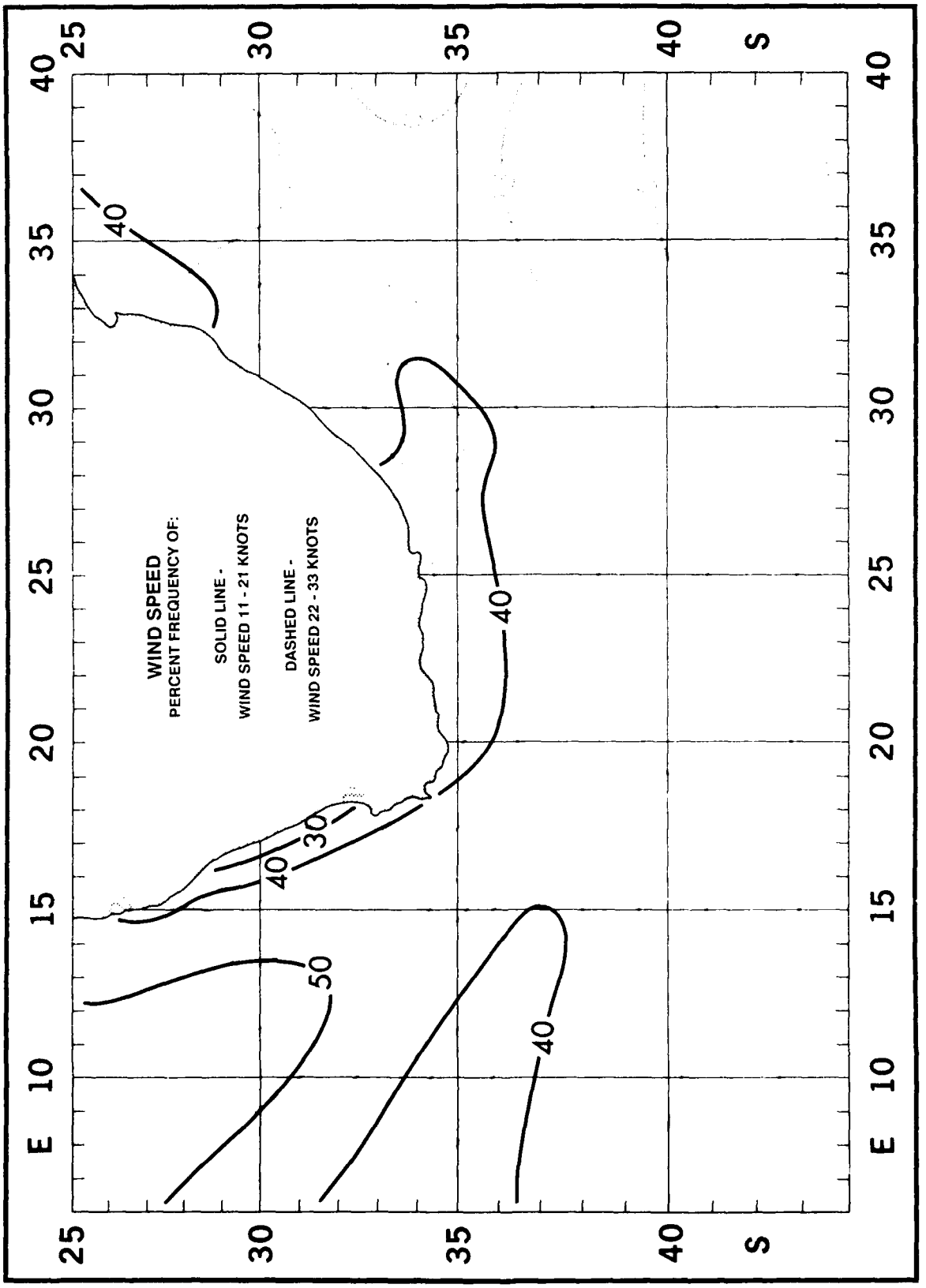


March

Wind Speed <11 and ≥34 Knots

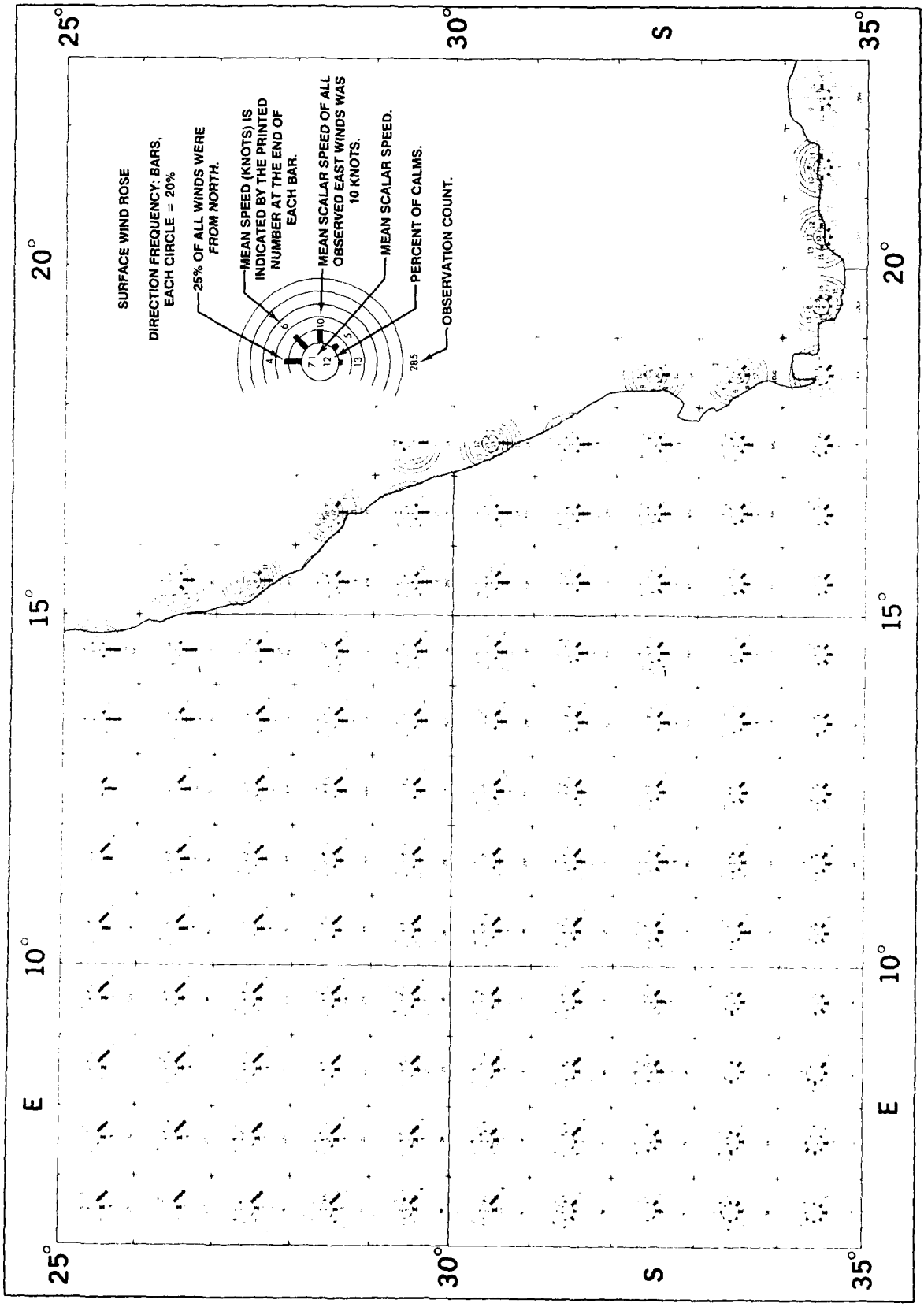


March **Wind Speed 11 - 21 and 22 - 33 Knots**



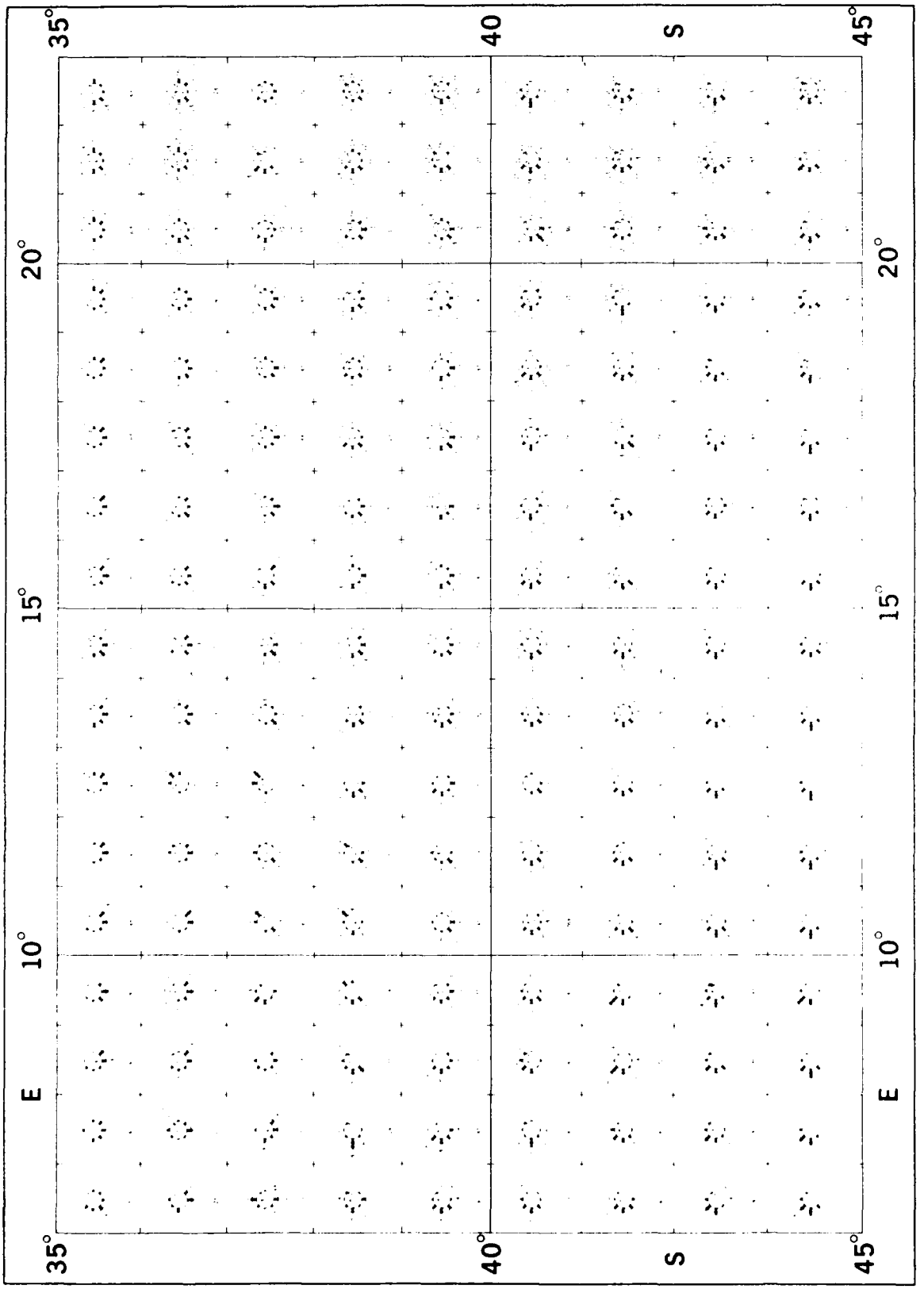
March

Surface Wind Roses



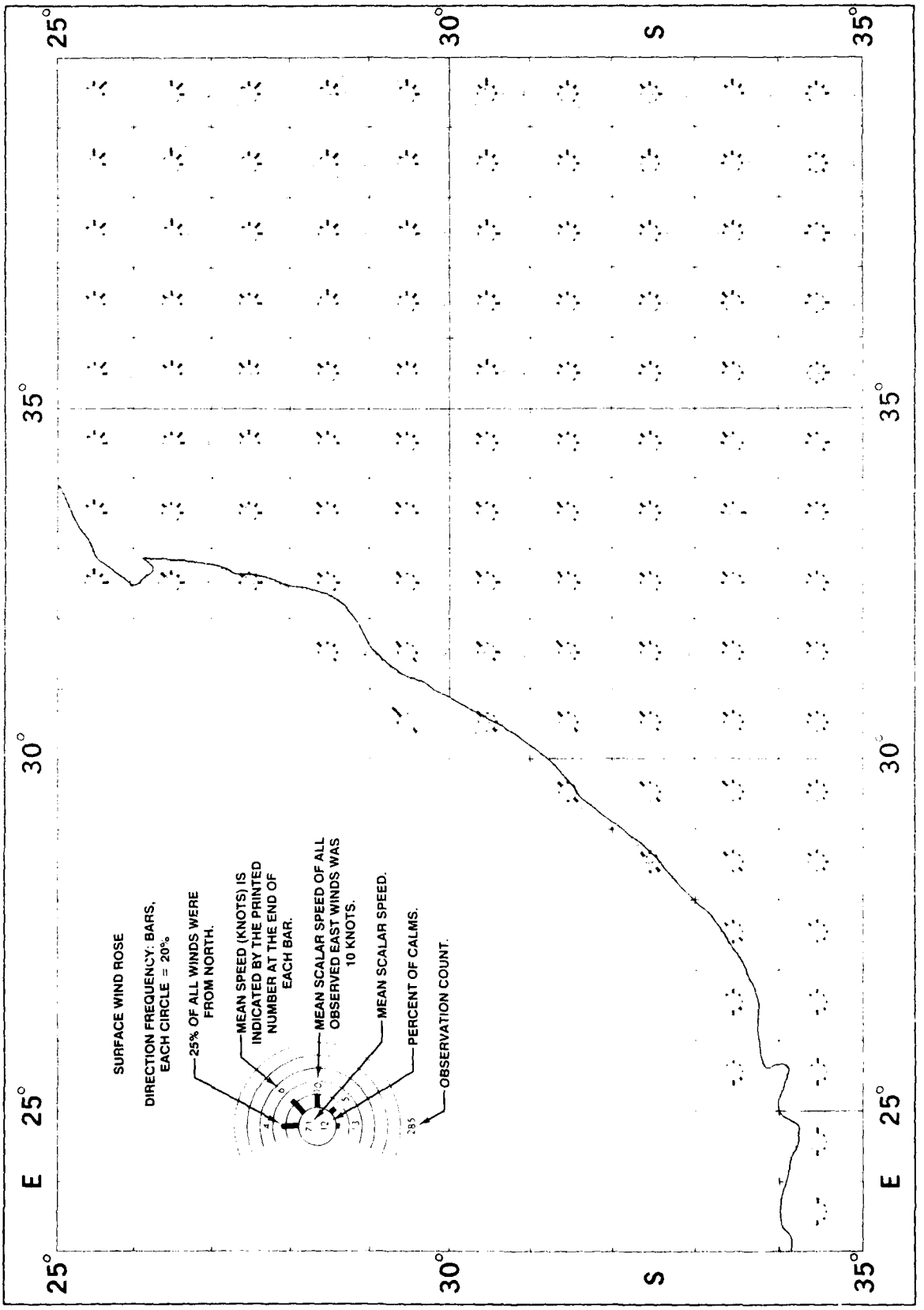
March

Surface Wind Roses



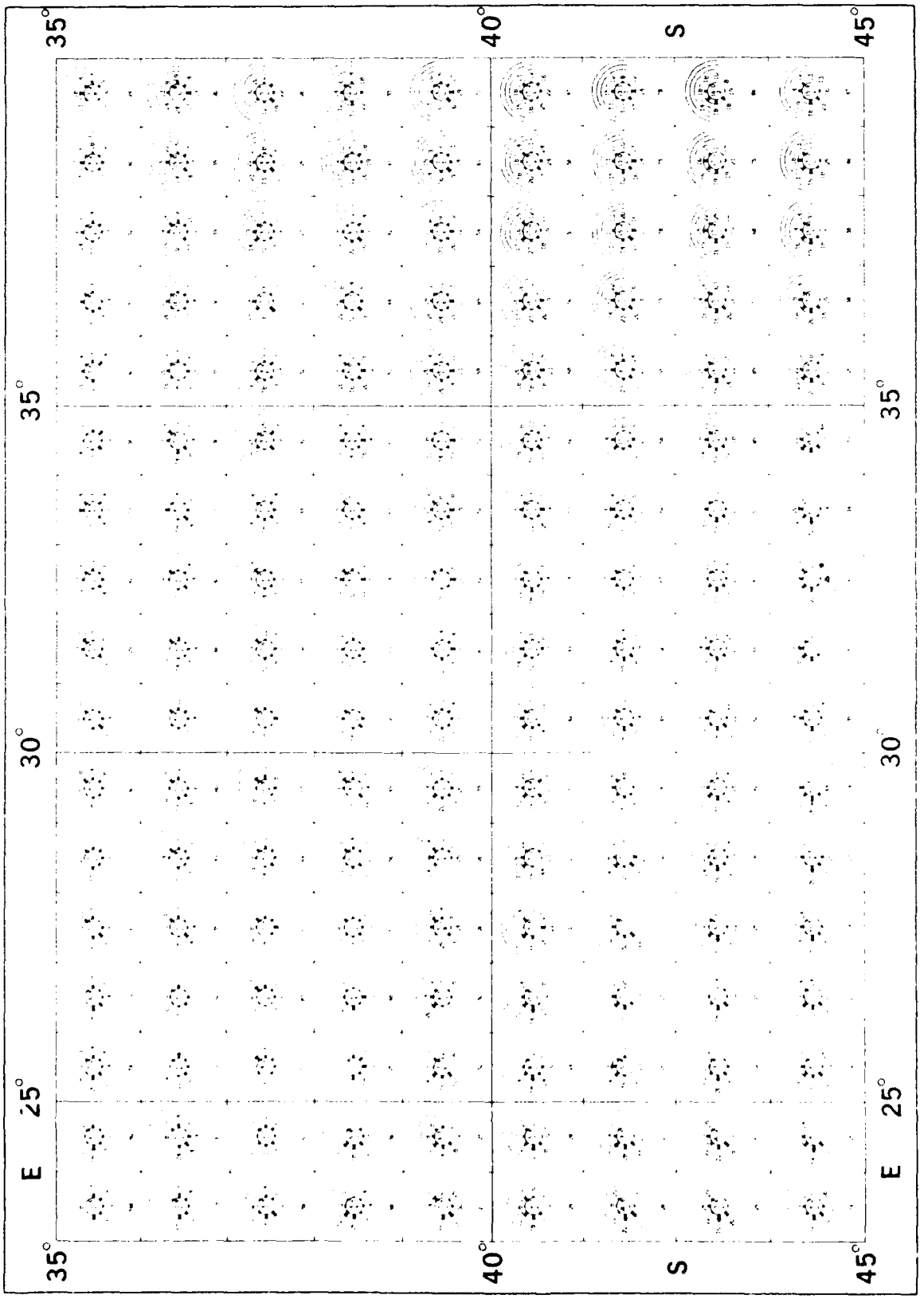
March

Surface Wind Roses

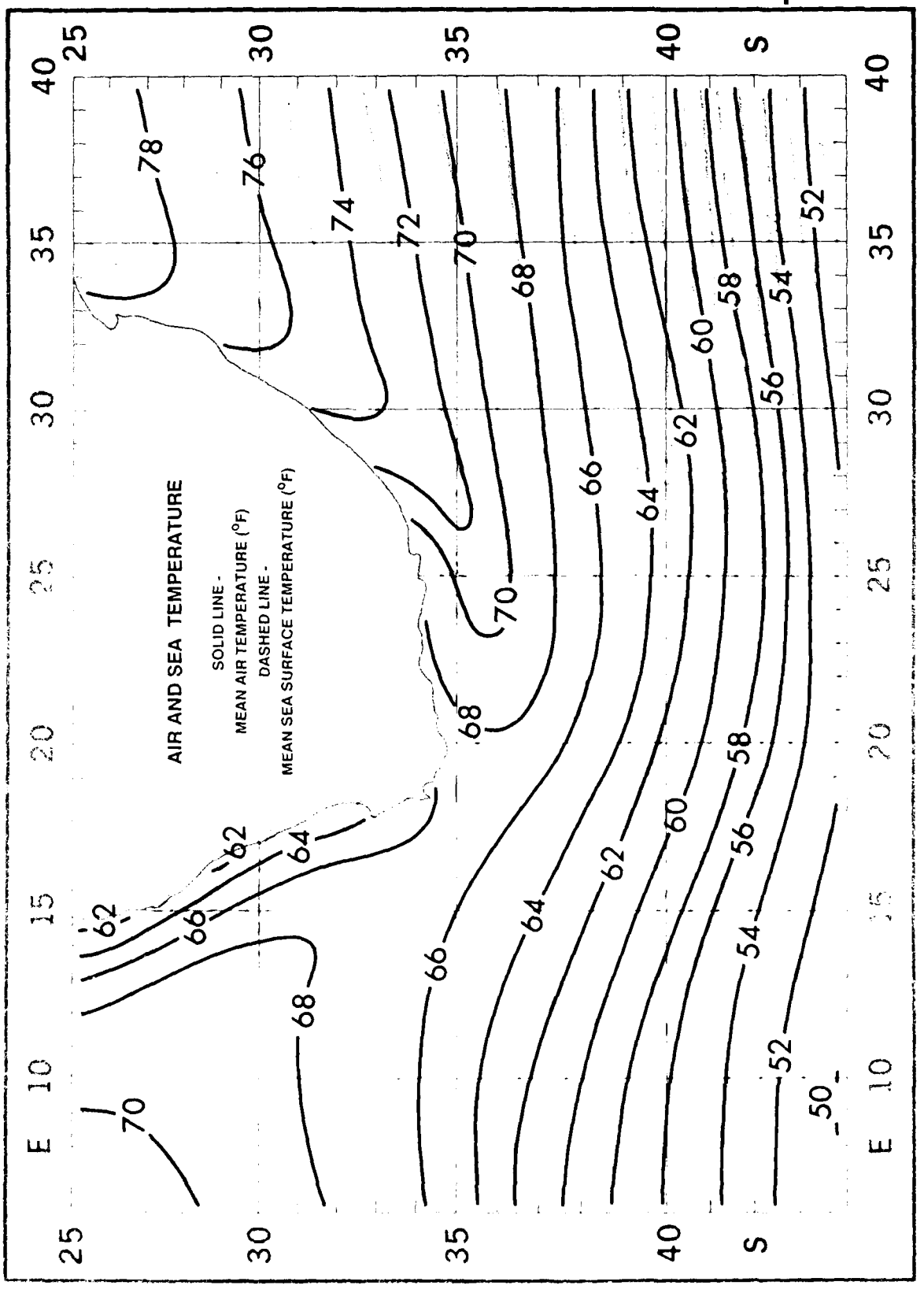


March

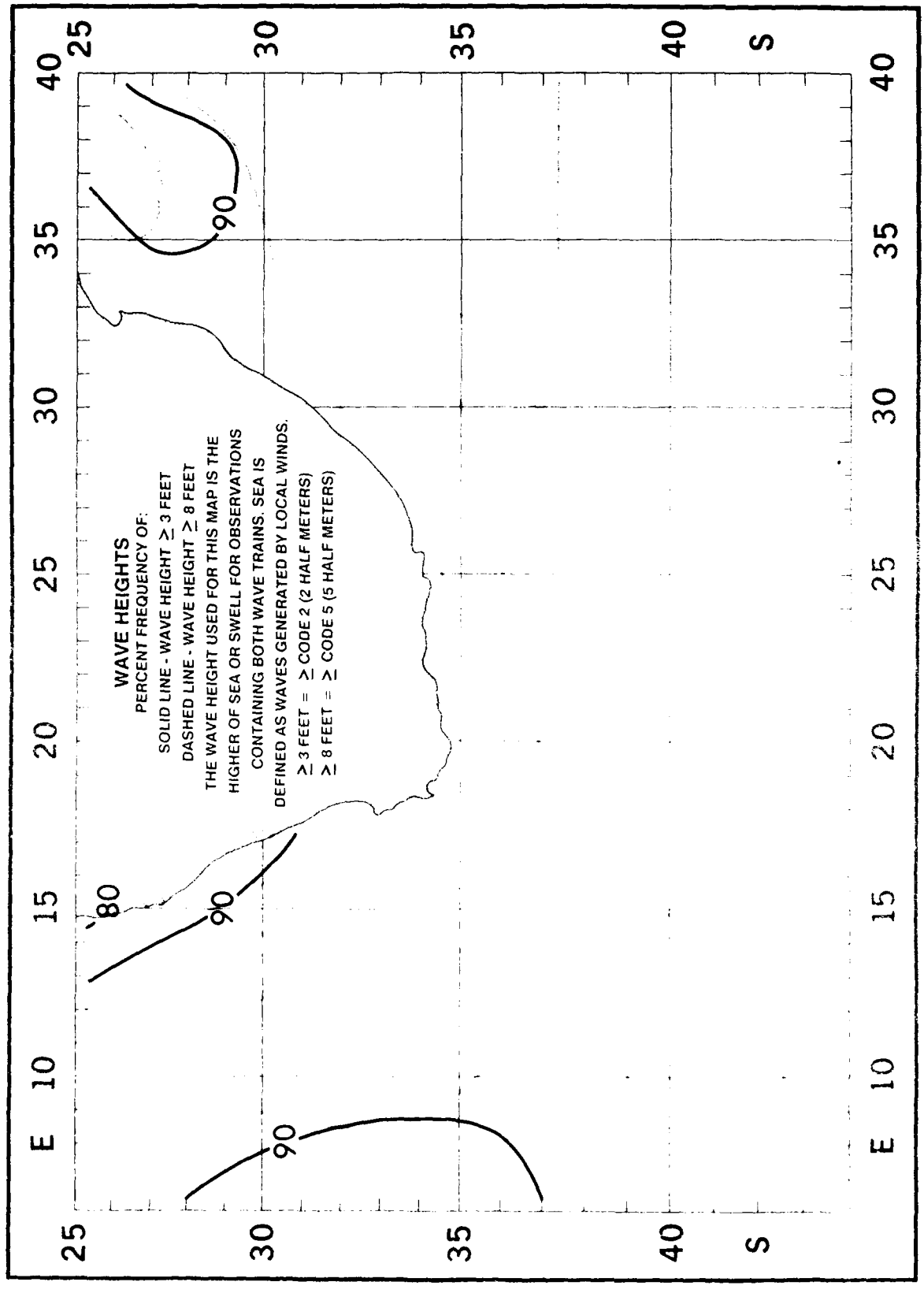
Surface Wind Roses



March **Air and Sea Temperature**

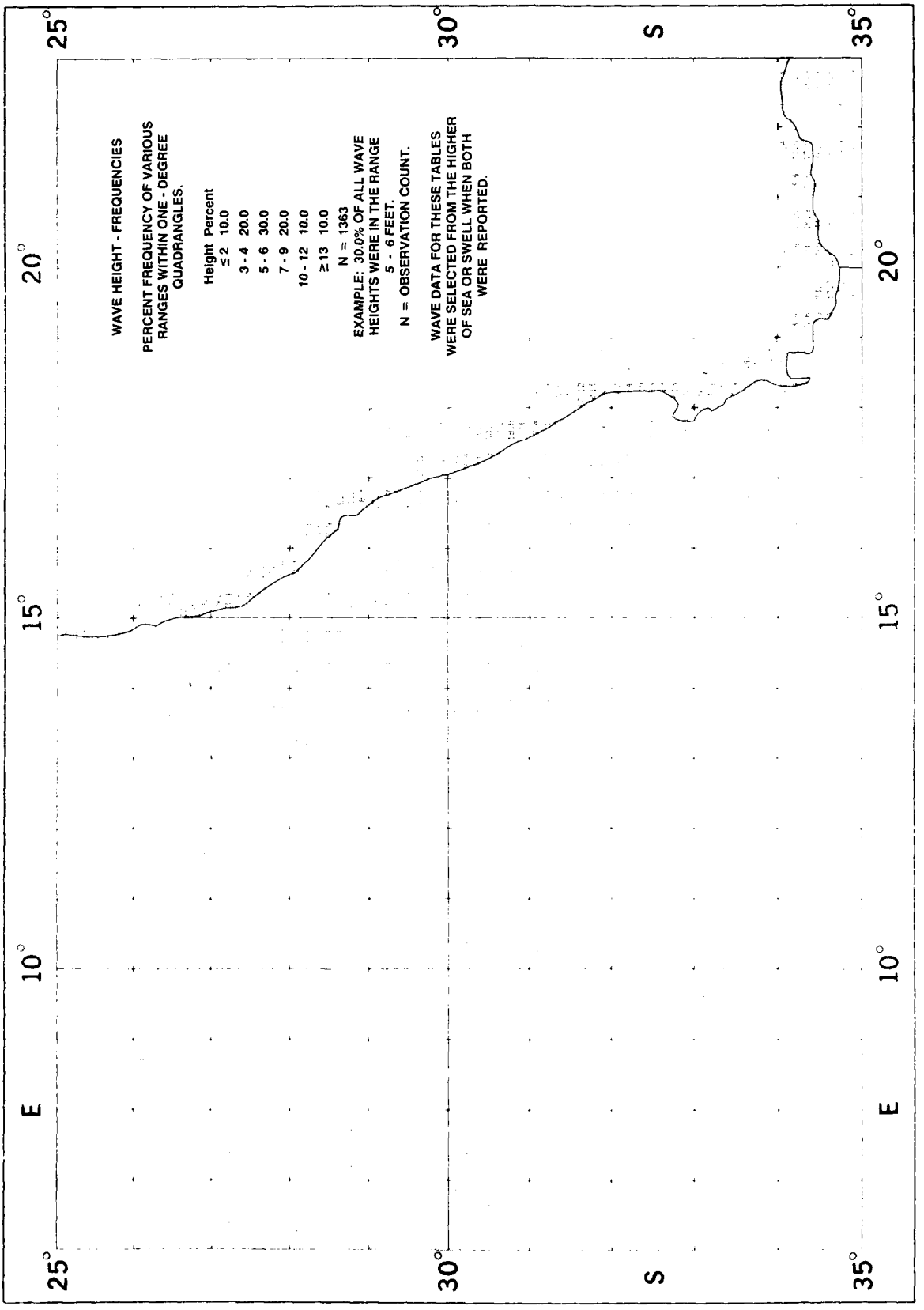


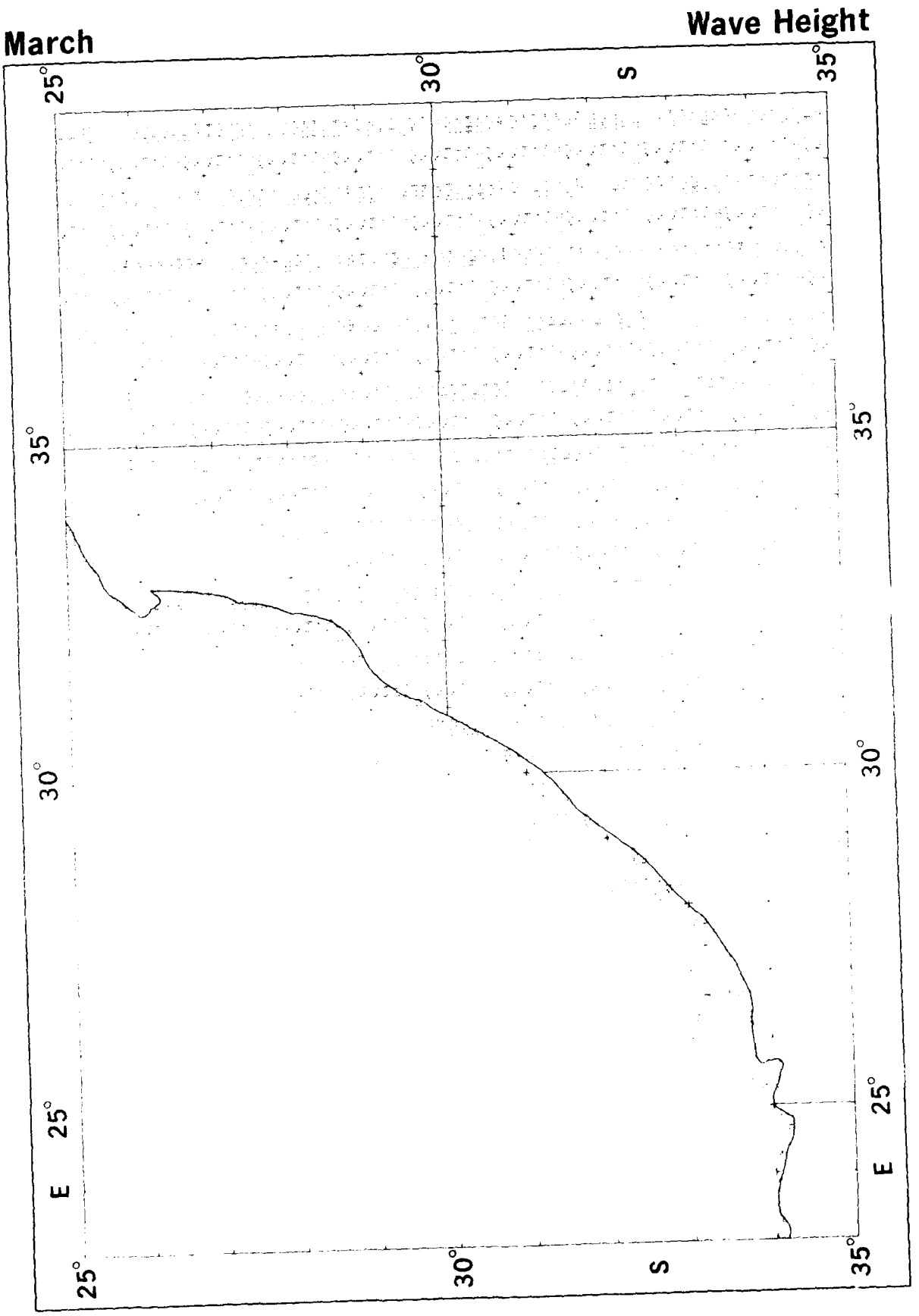
March **Wave Height**



March

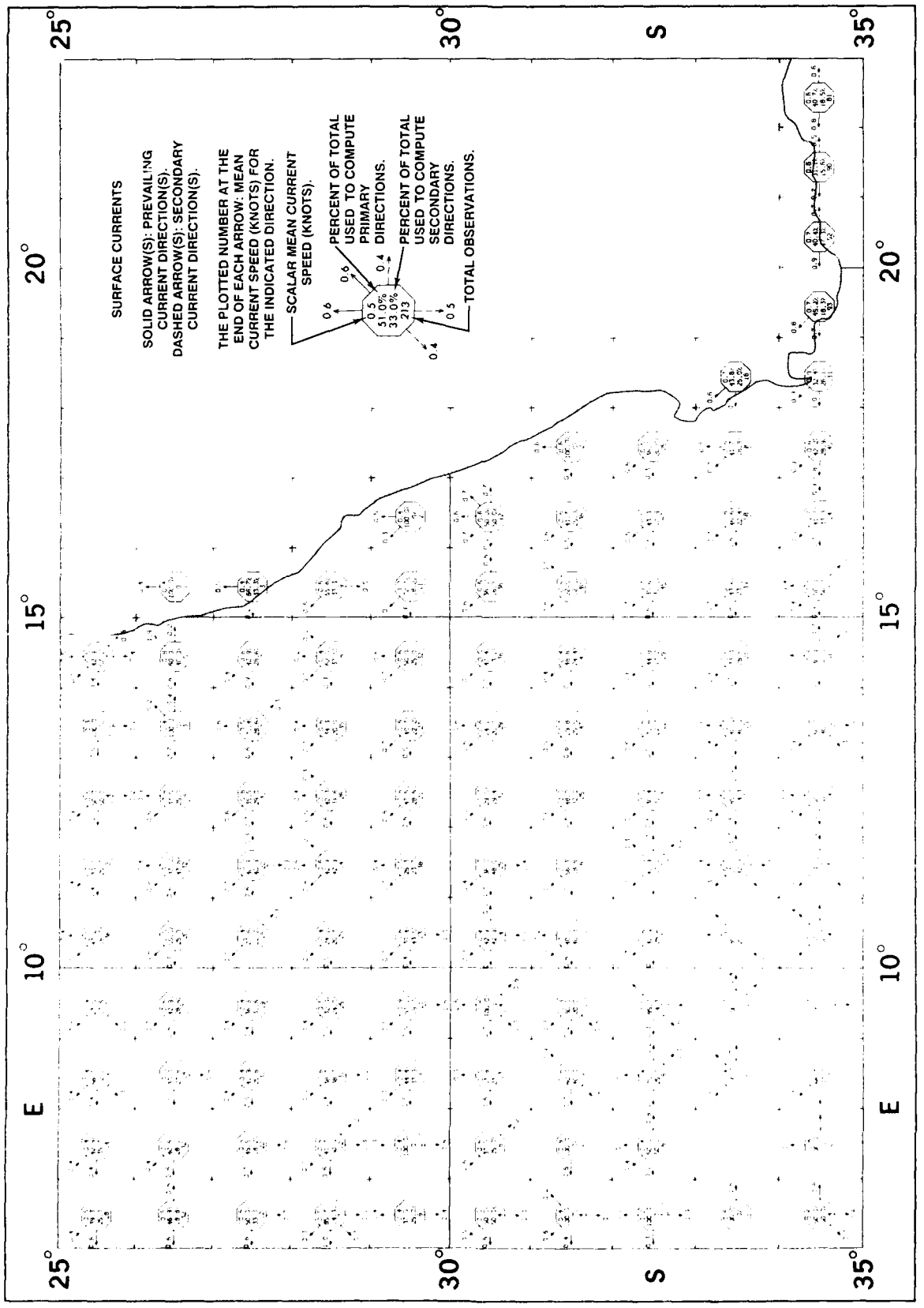
Wave Height




March
Wave Height
25°
30°
S
35°
35°
30°
25°
E

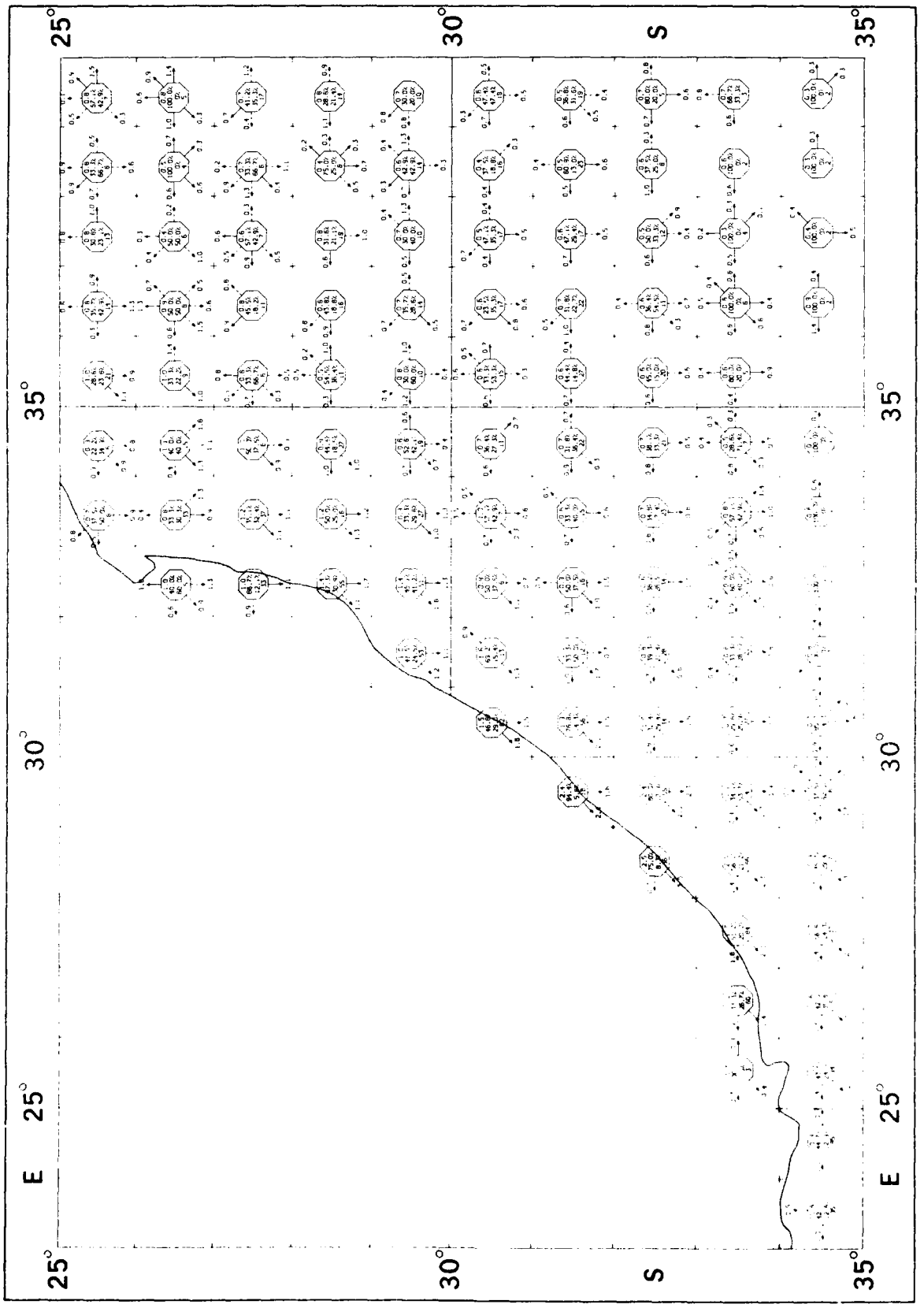
March

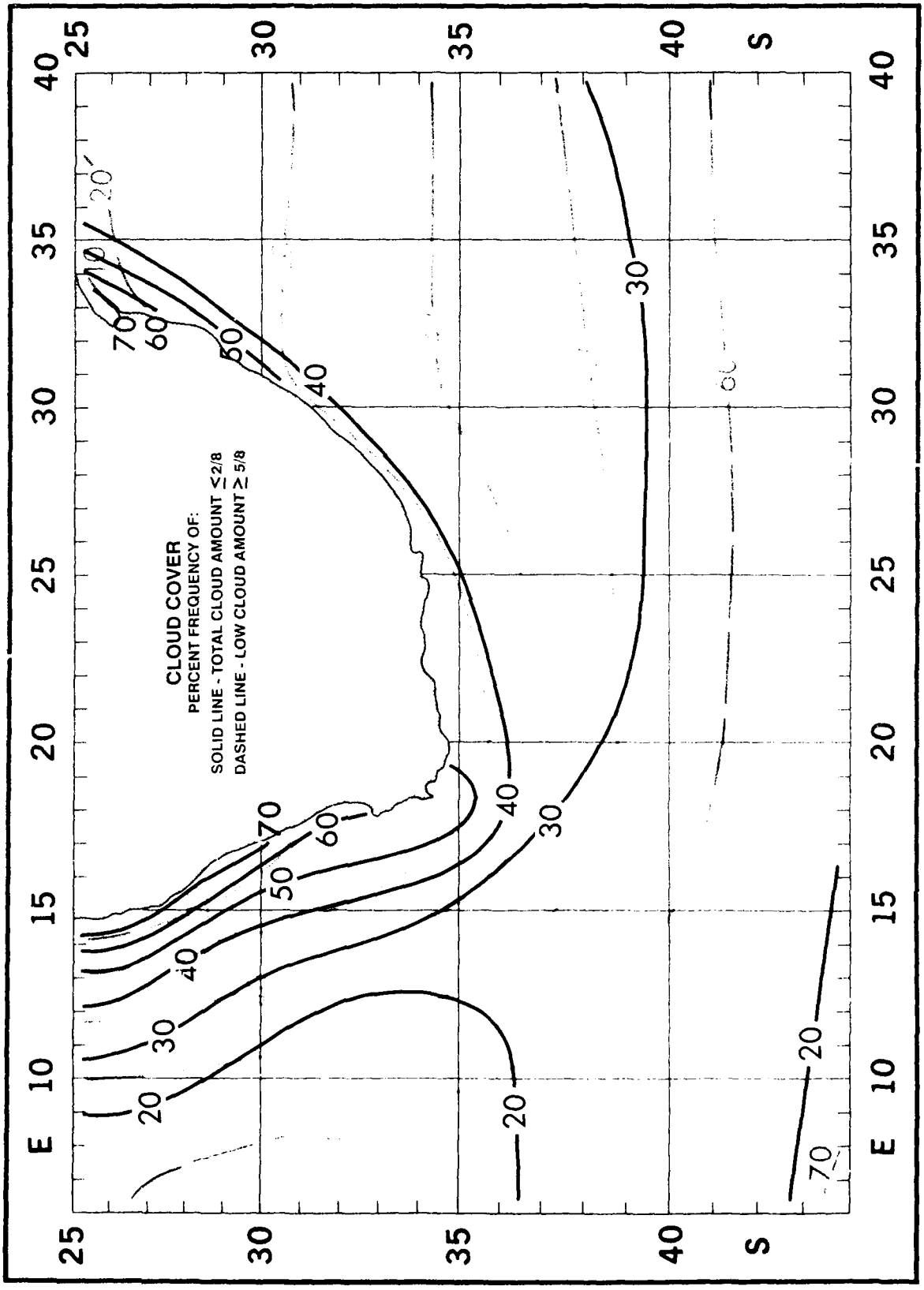
Surface Currents

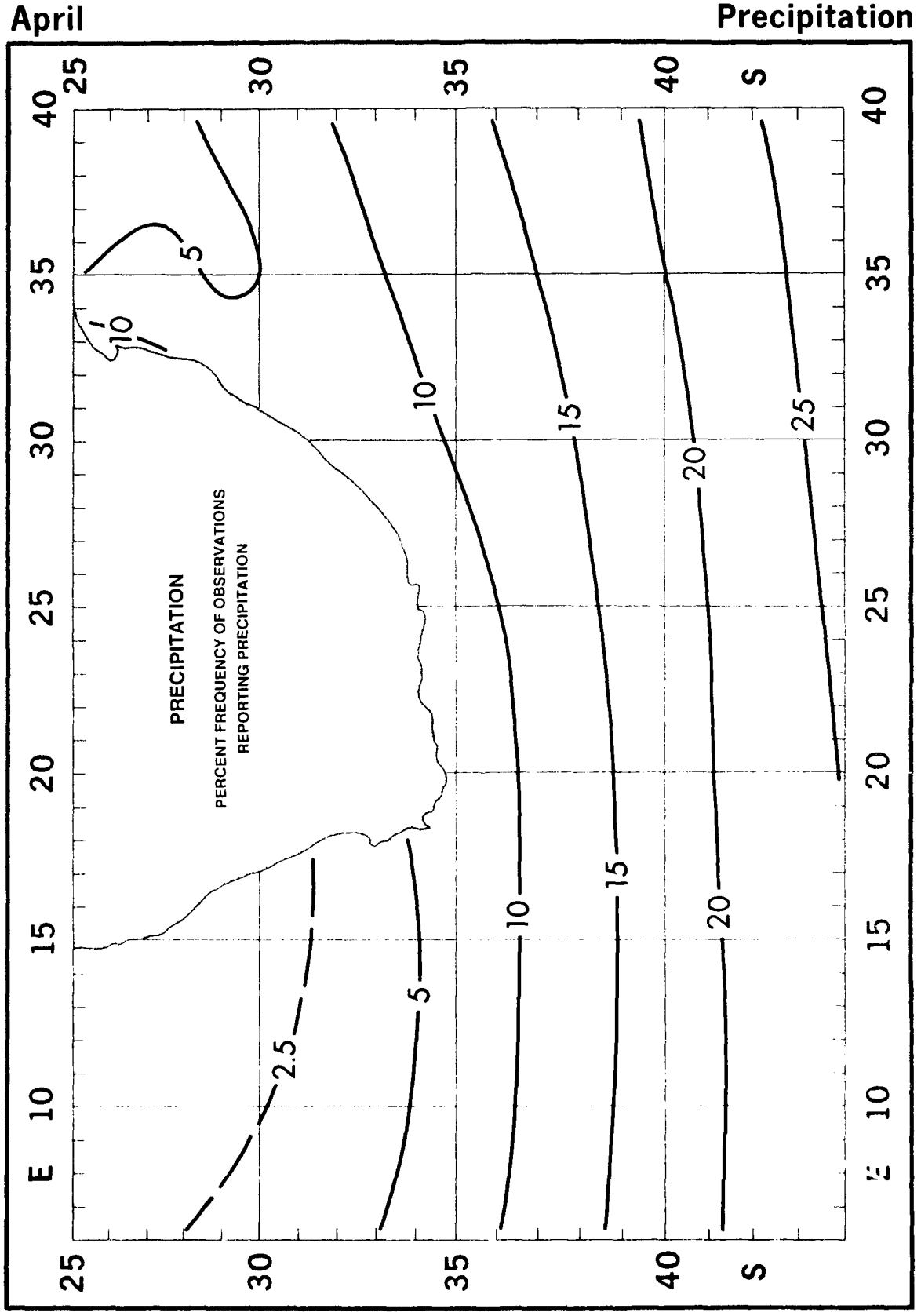


March

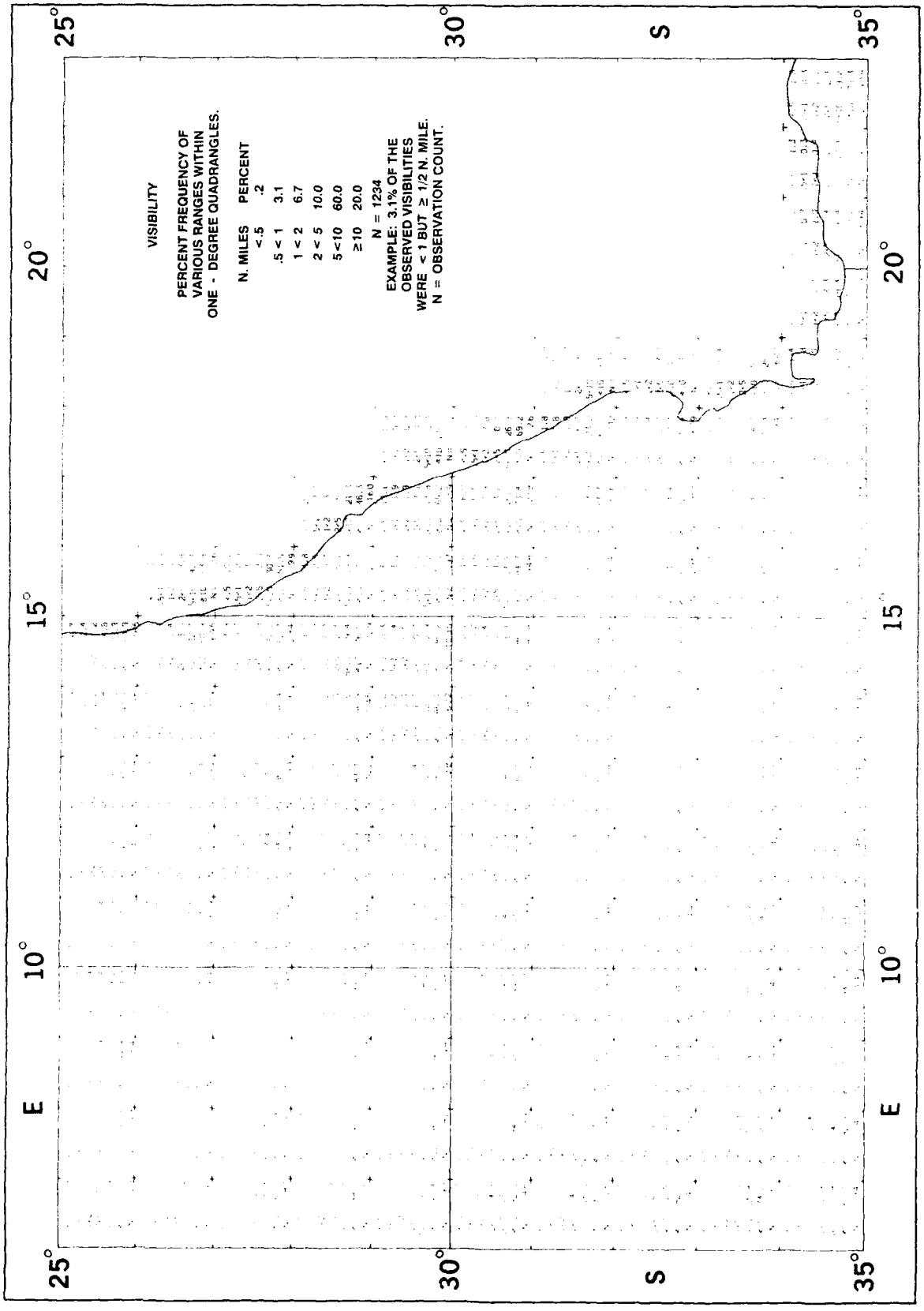
Surface Currents




CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE - TOTAL CLOUD AMOUNT ≤2/8
DASHED LINE - LOW CLOUD AMOUNT ≥ 5/8
E
S
25
30
35
40
10
15
20
70
60
50
40
30
20

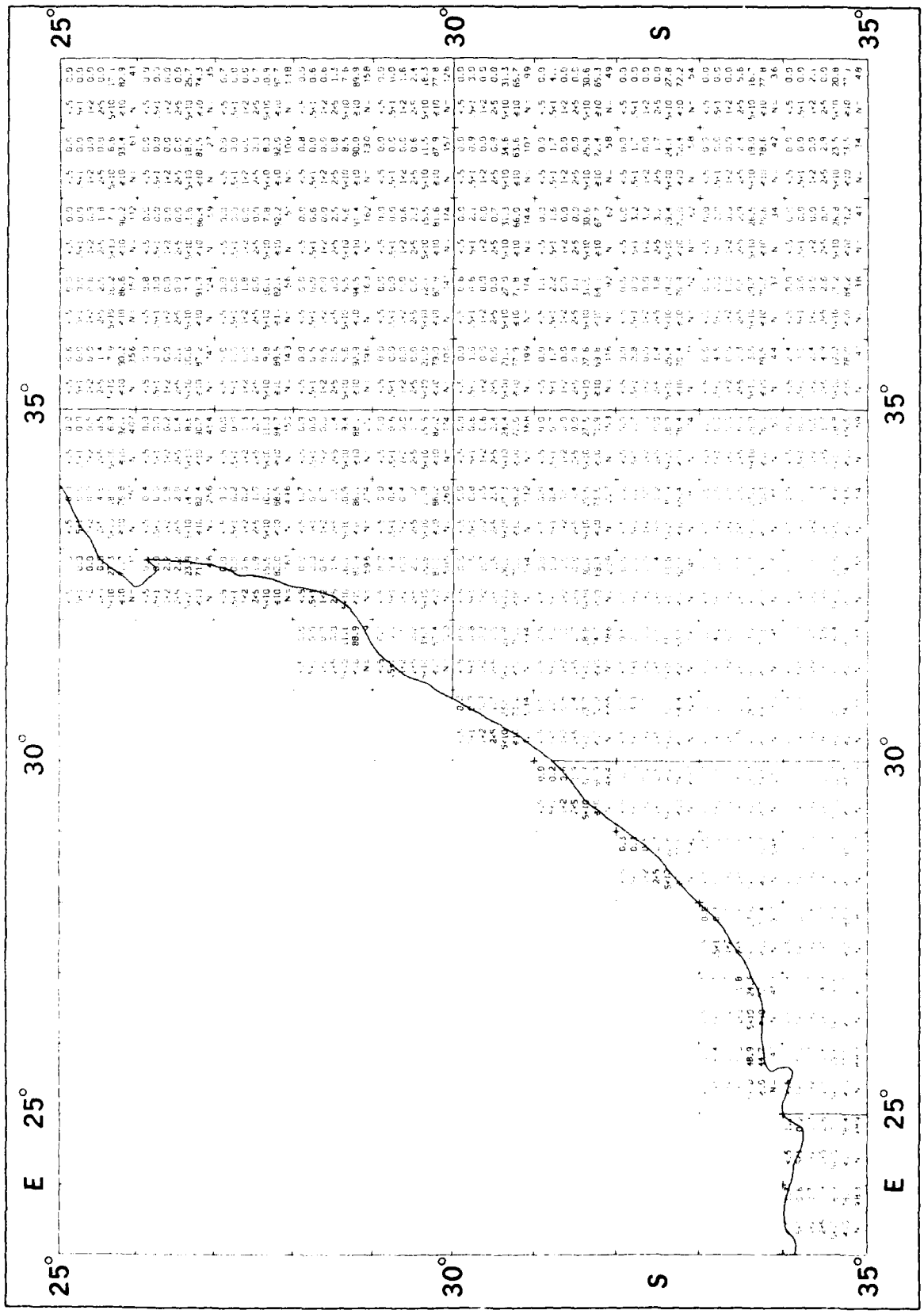

April
Precipitation
PRECIPITATION
PERCENT FREQUENCY OF OBSERVATIONS
REPORTING PRECIPITATION
25
30
35
40
S
E
10
15
20
25
30
35
40
1
2.5
5
10
15
20
25

April Visibility

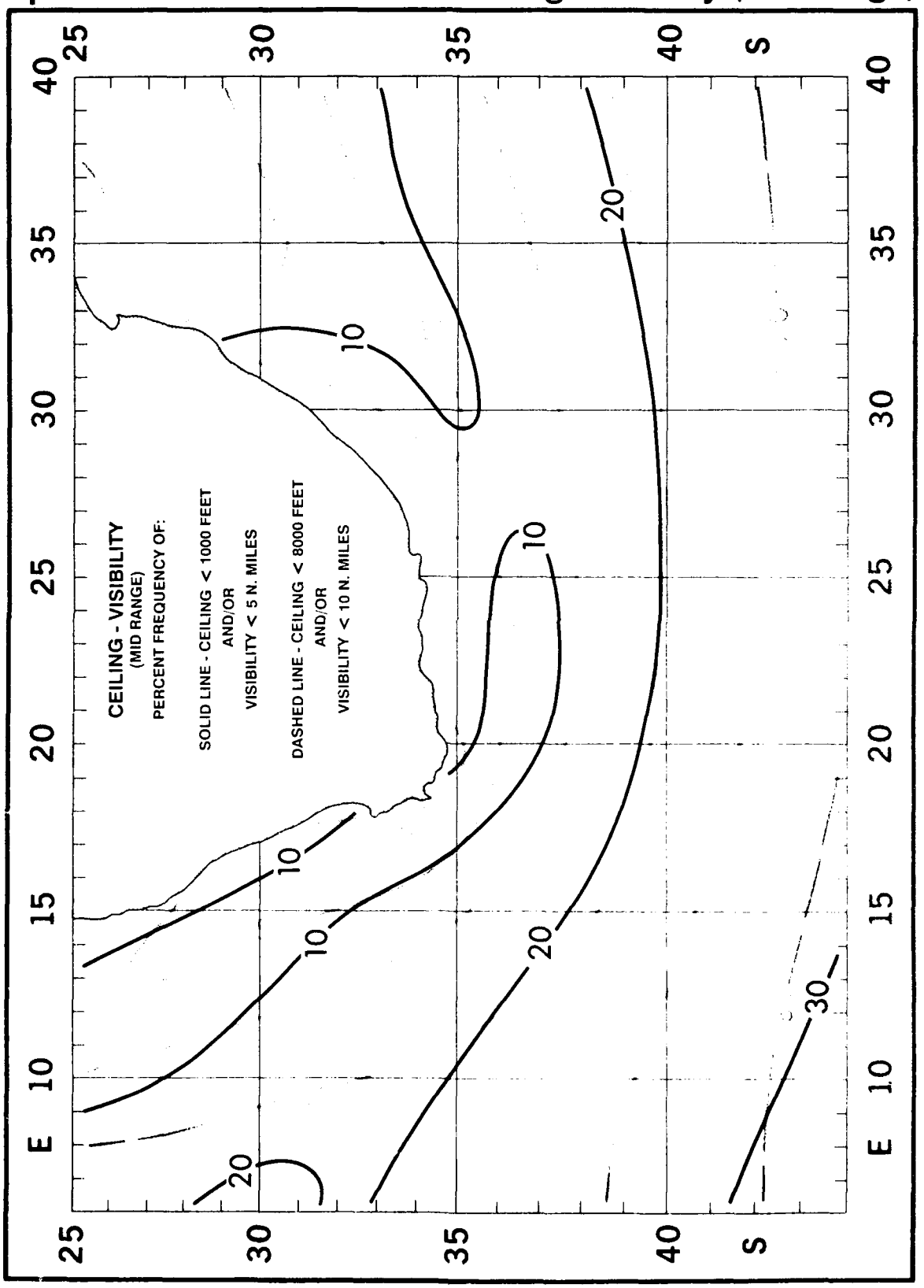


April

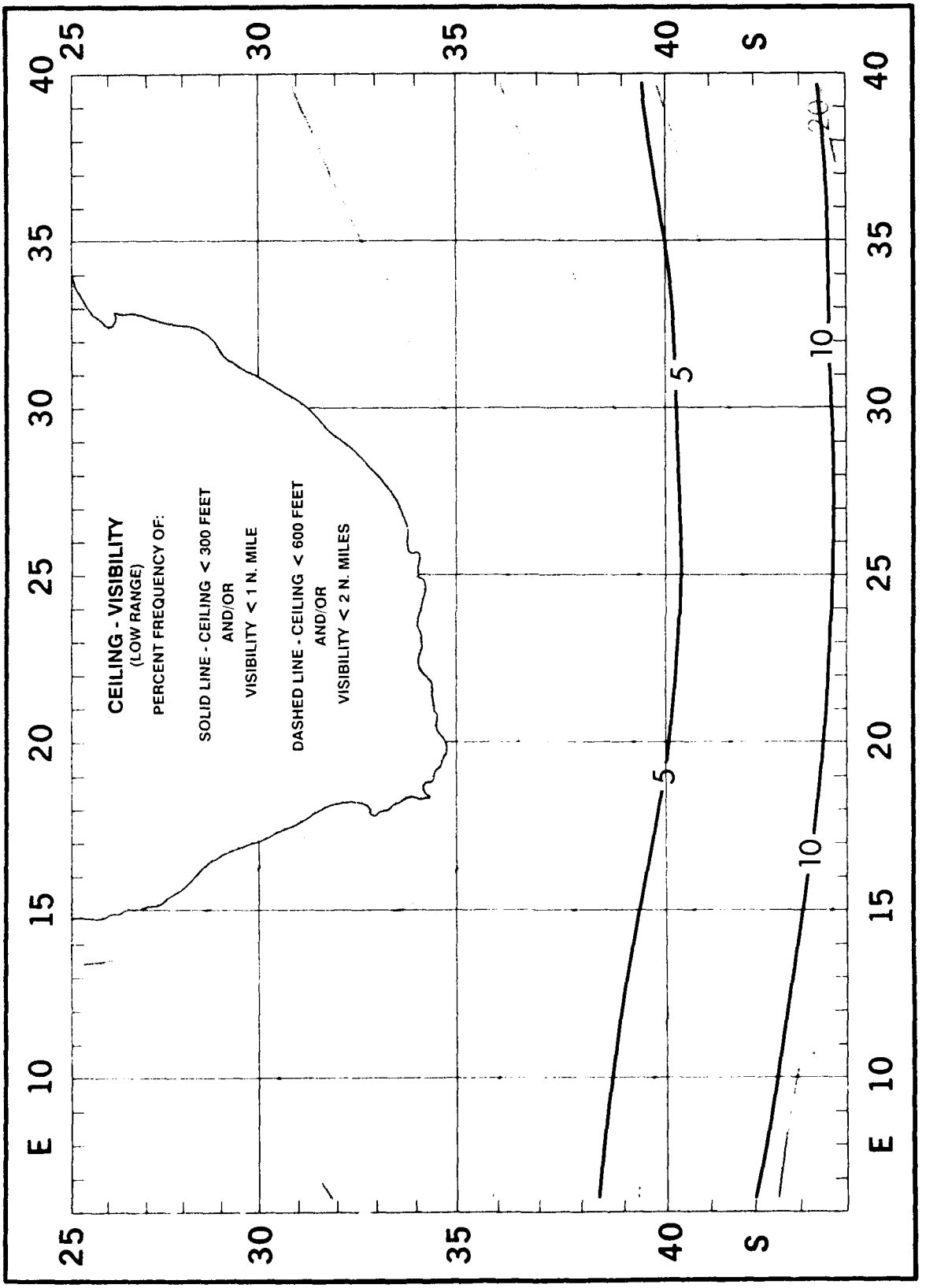
Visibility

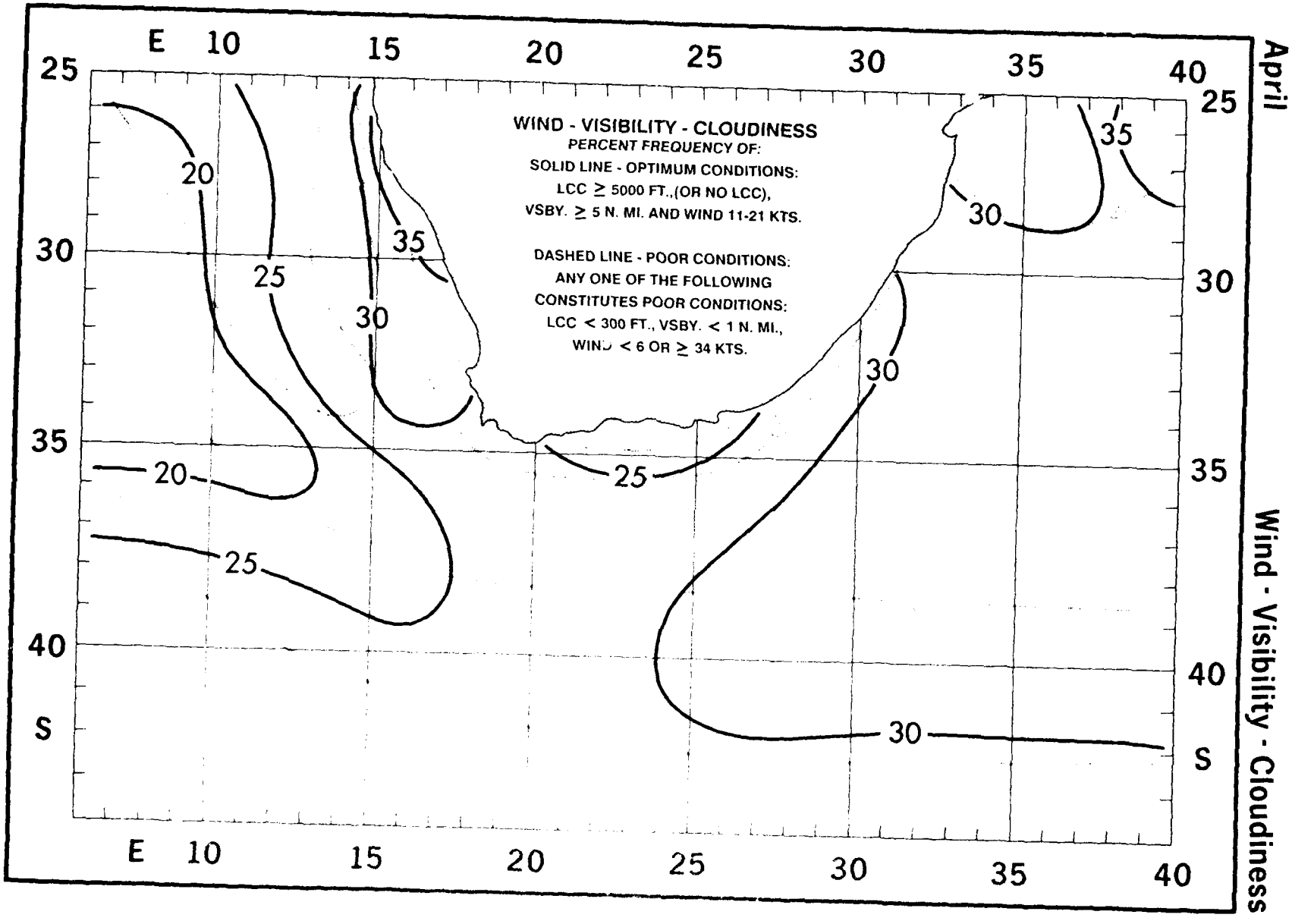


April **Ceiling - Visibility (Mid Range)**



April **Ceiling - Visibility (Low Range)**

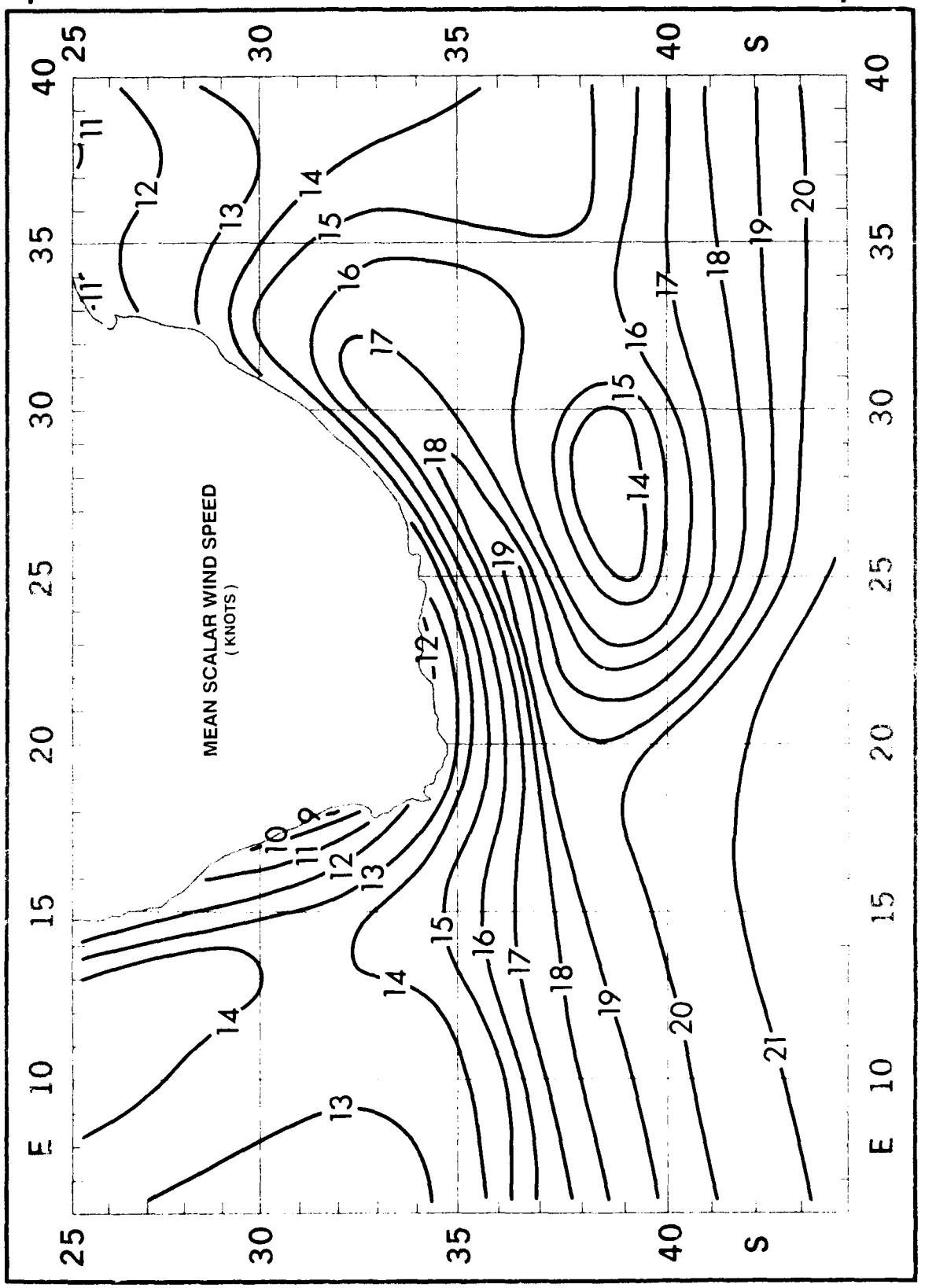




April

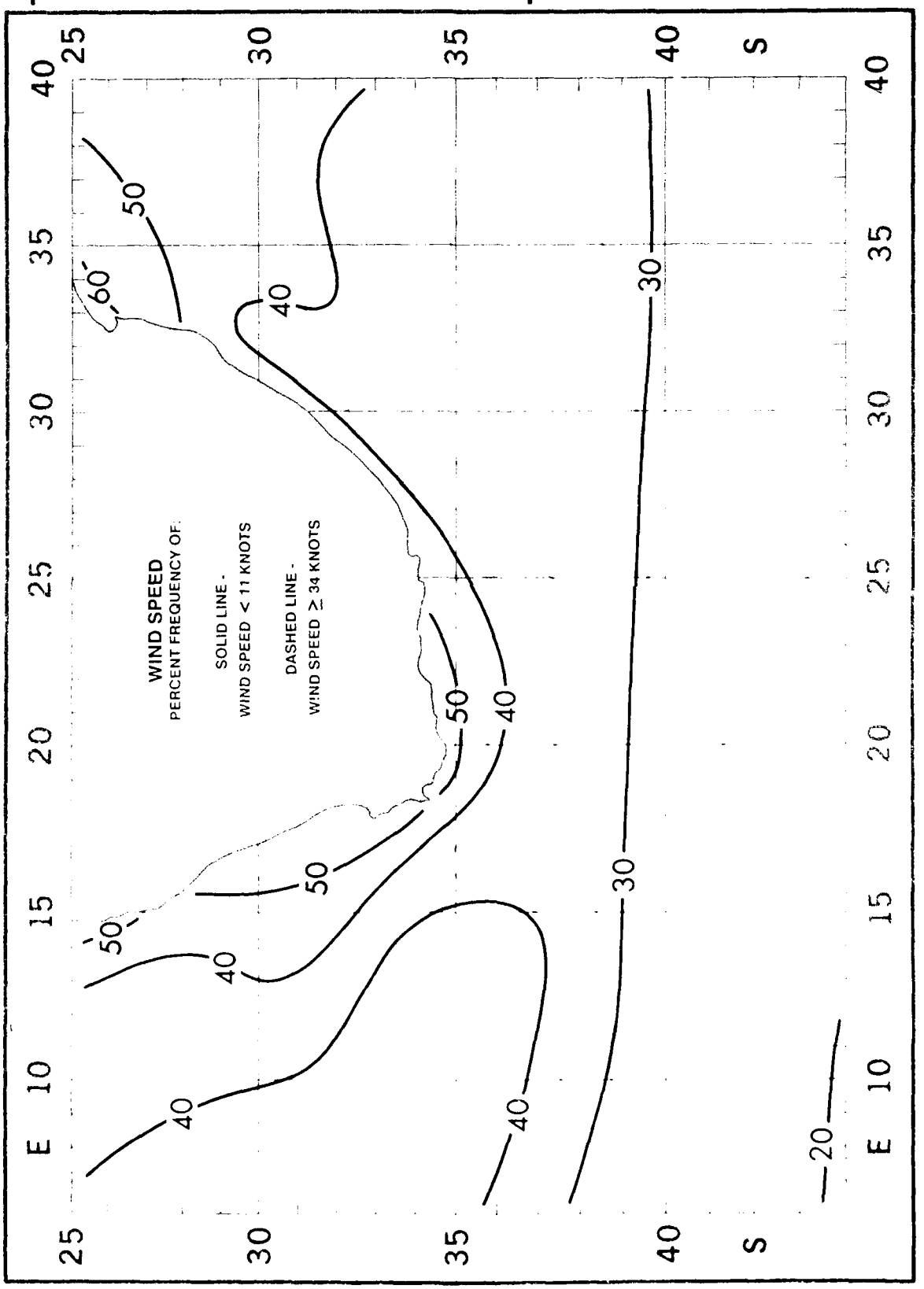
Wind - Visibility - Cloudiness

April **Mean Scalar Wind Speed**

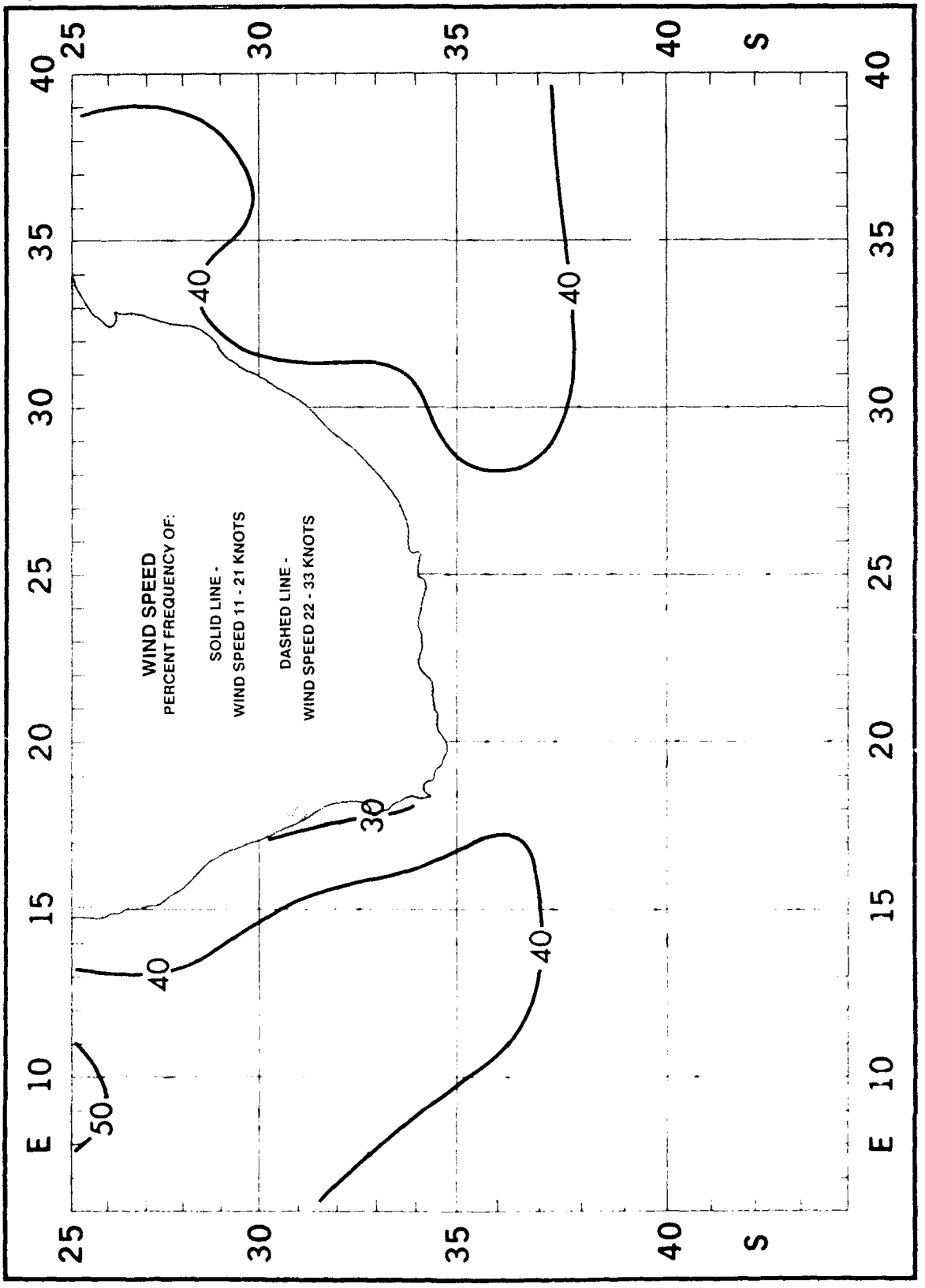


April

Wind Speed <11 and ≥34 Knots

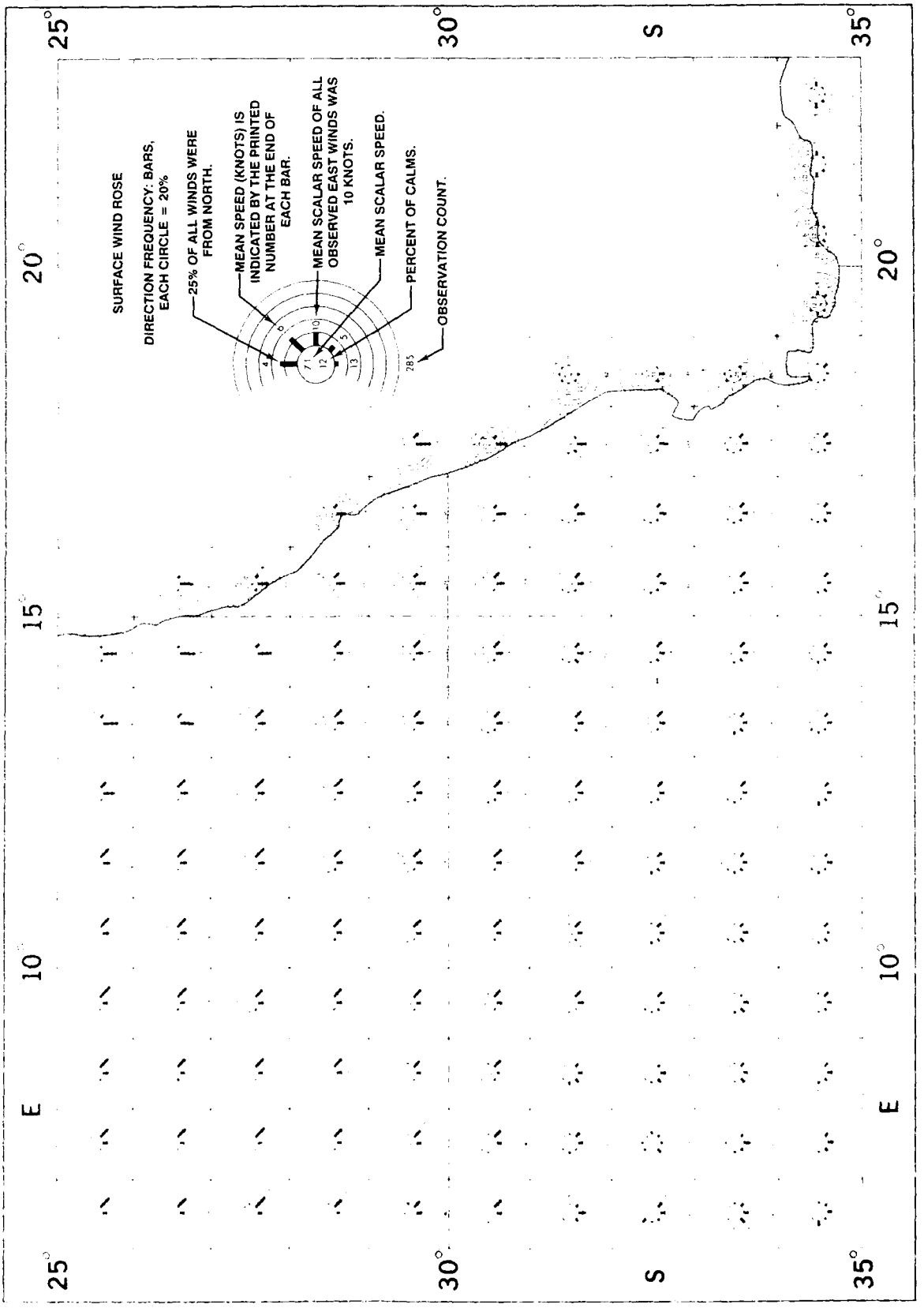


April **Wind Speed 11 - 21 and 22 - 33 Knots**



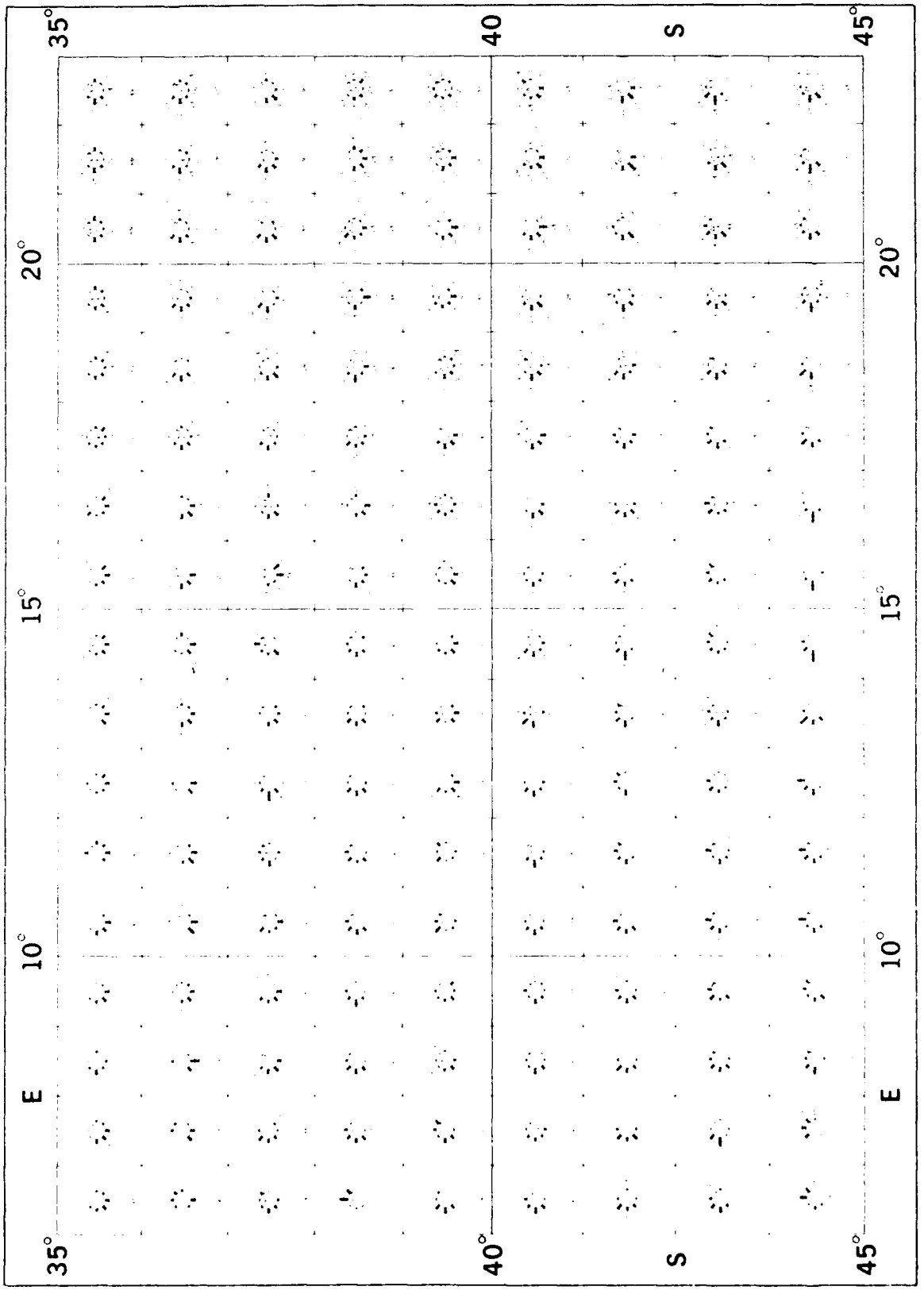
April

Surface Wind Roses



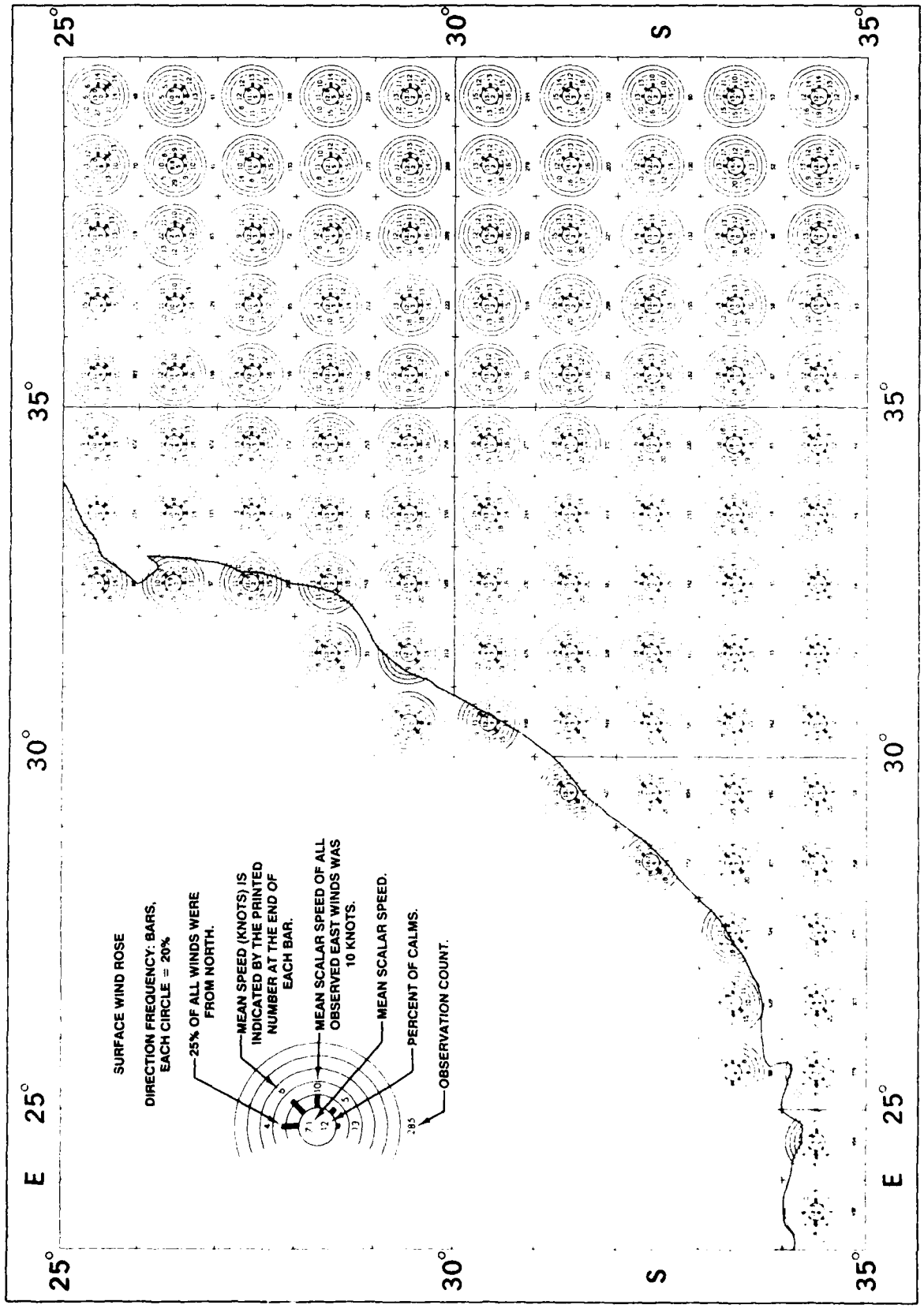
April

Surface Wind Roses



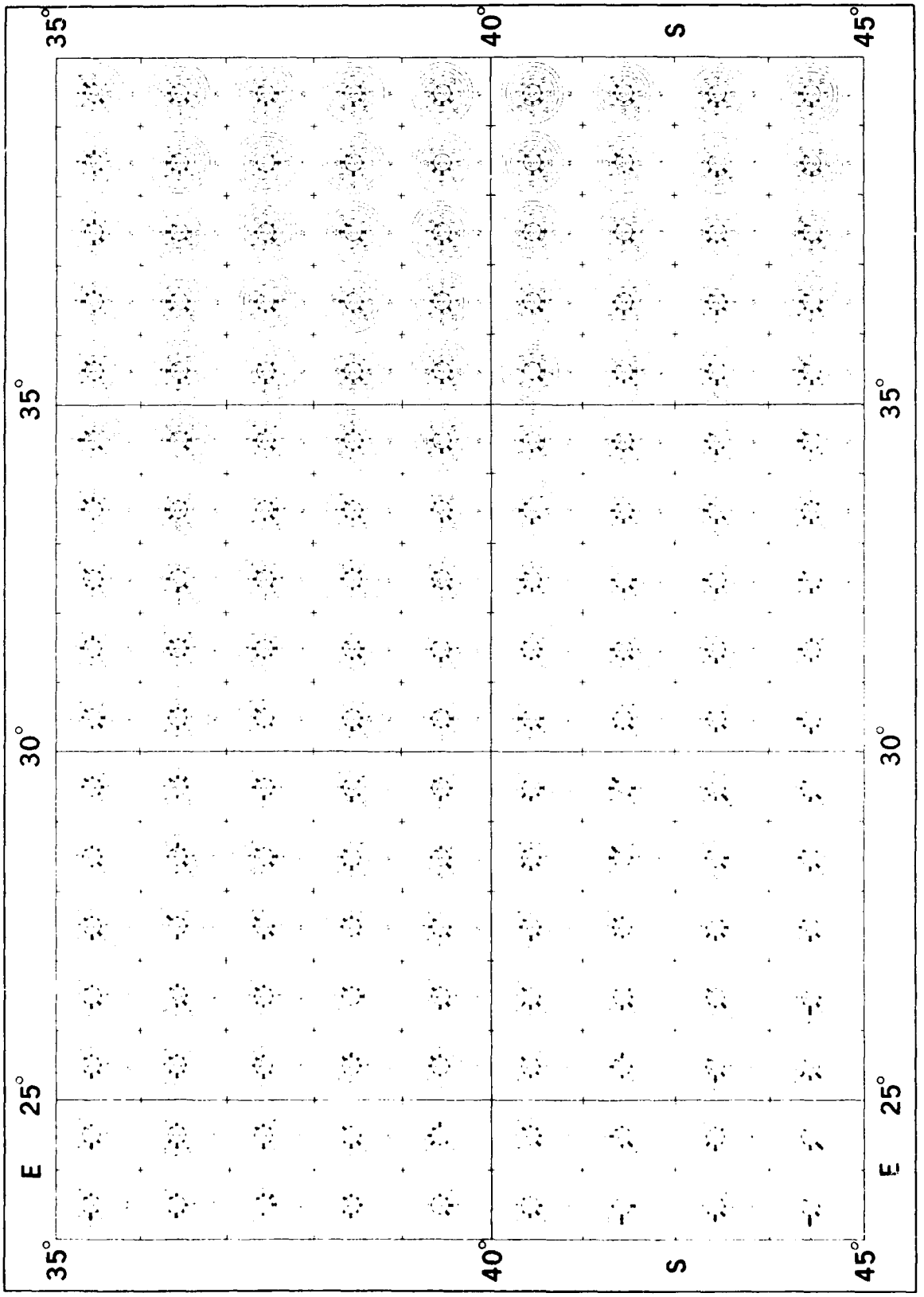
April

Surface Wind Roses



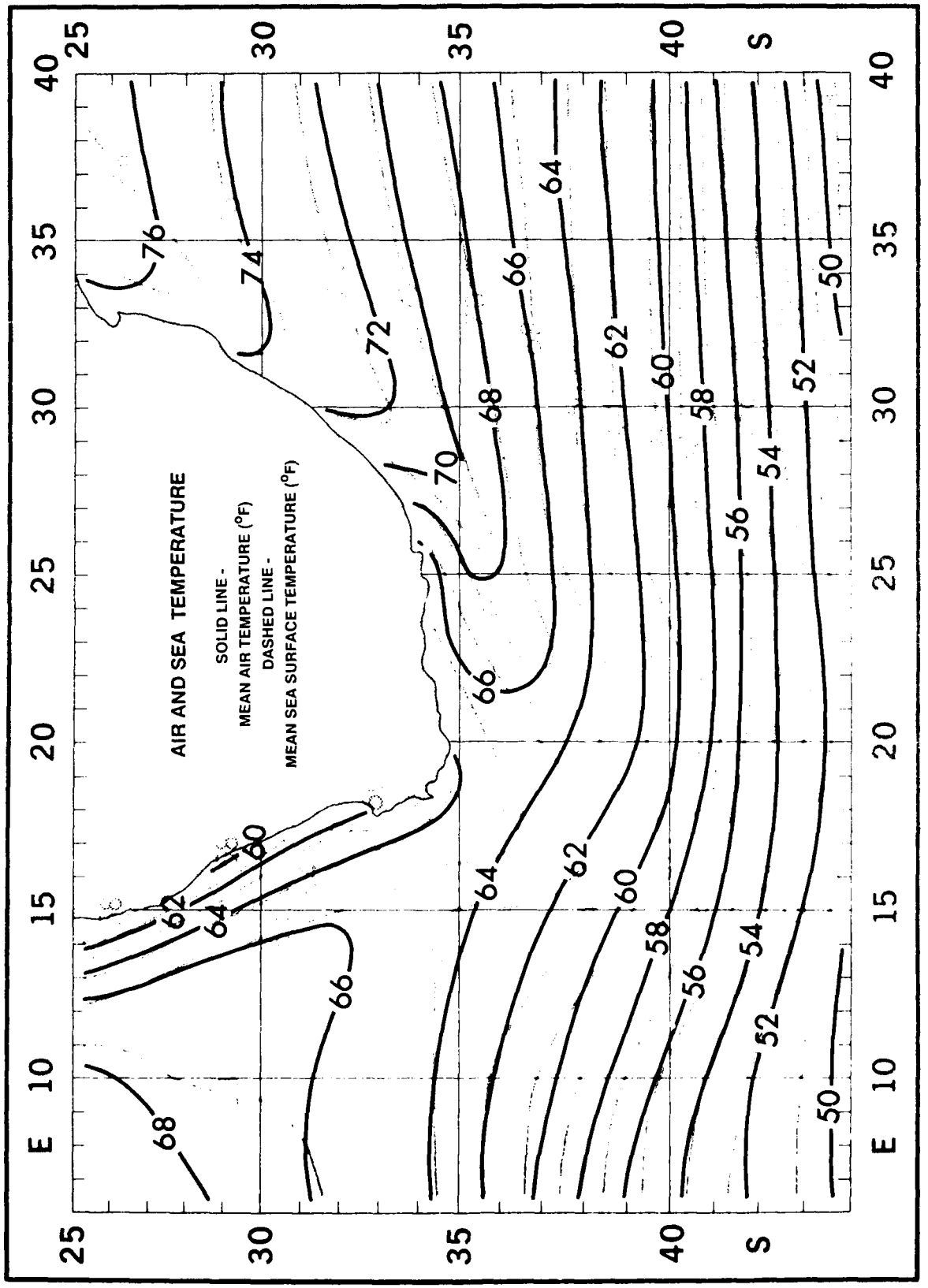
April

Surface Wind Roses



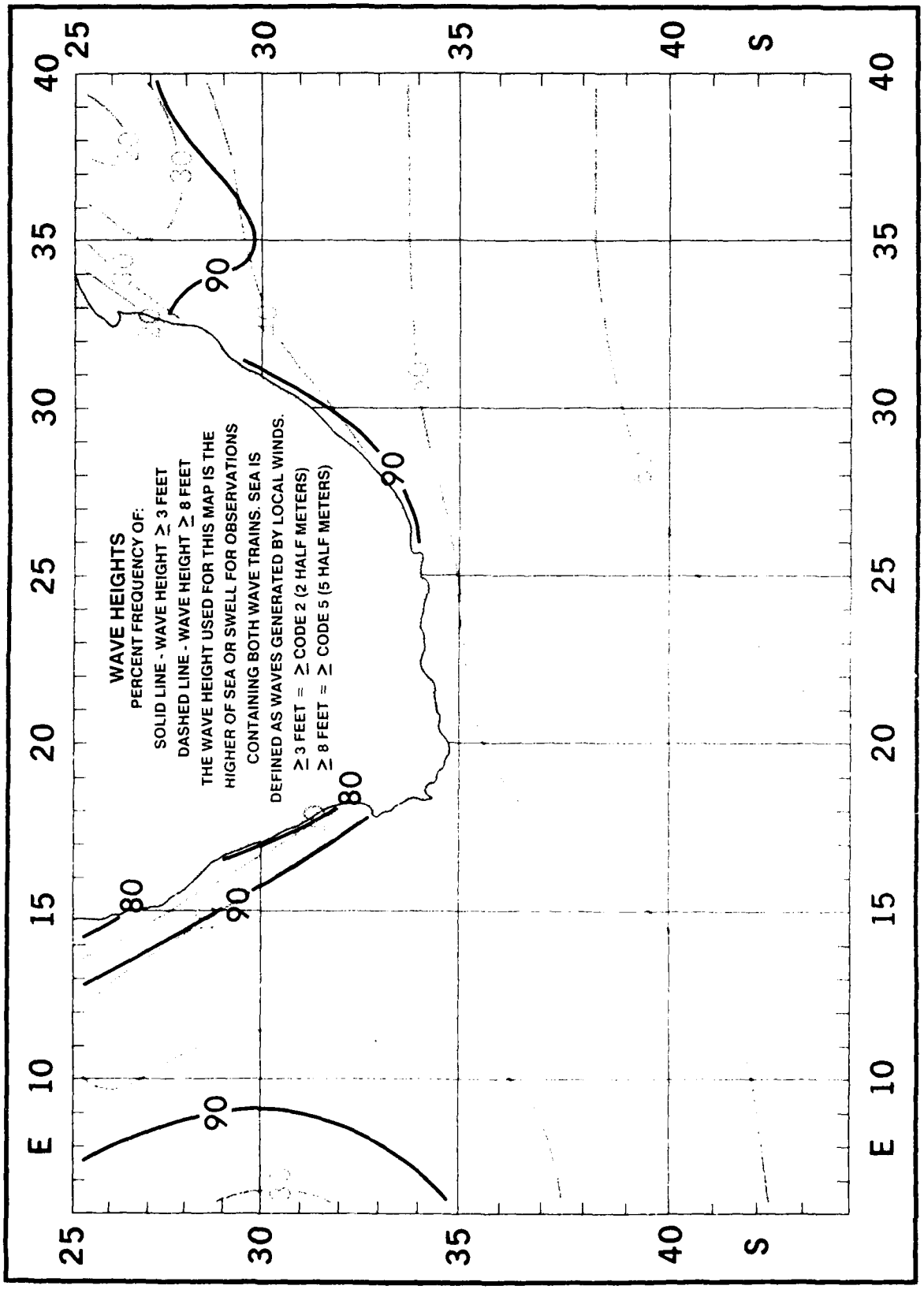
April

Air and Sea Temperature



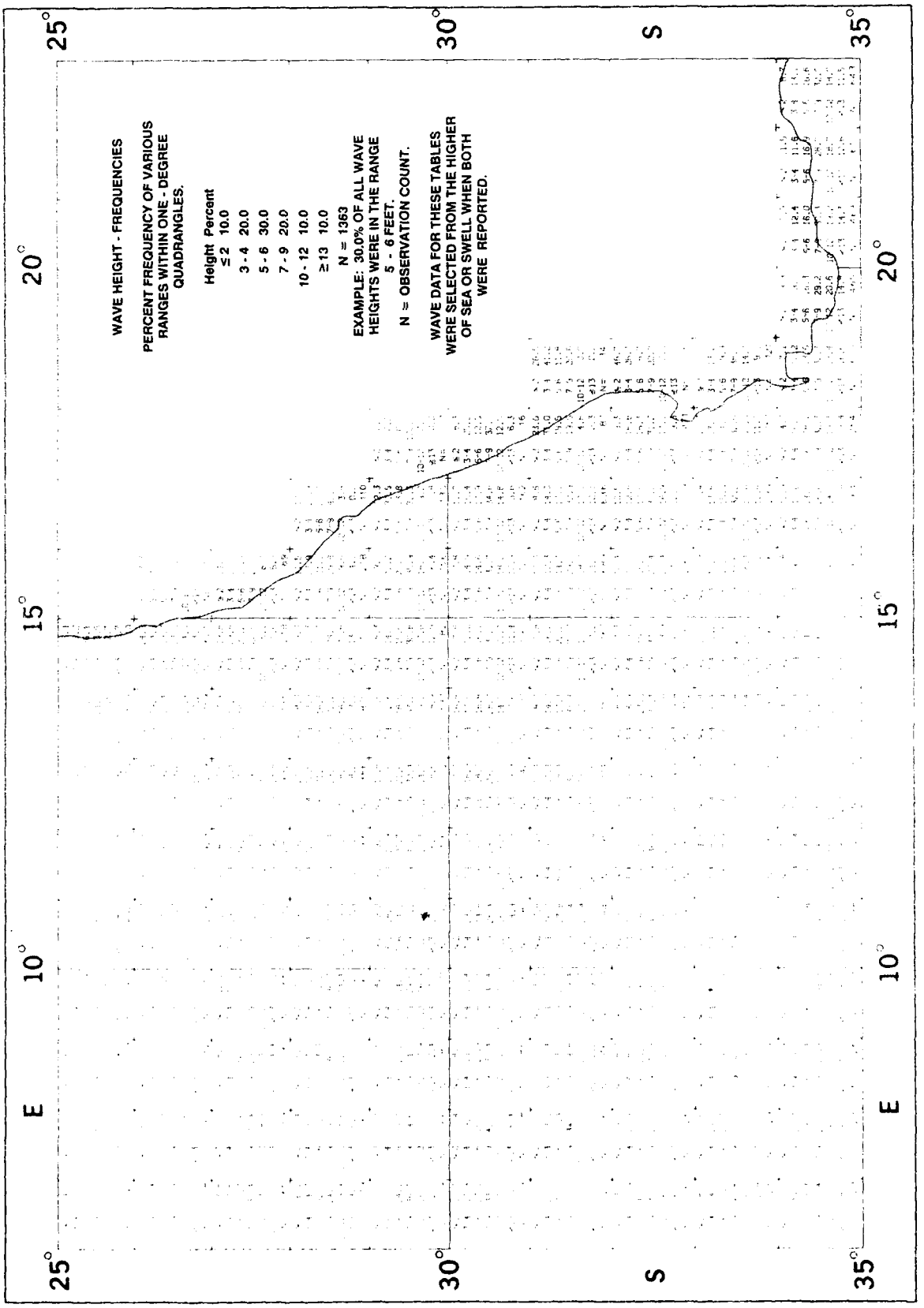
April

Wave Height

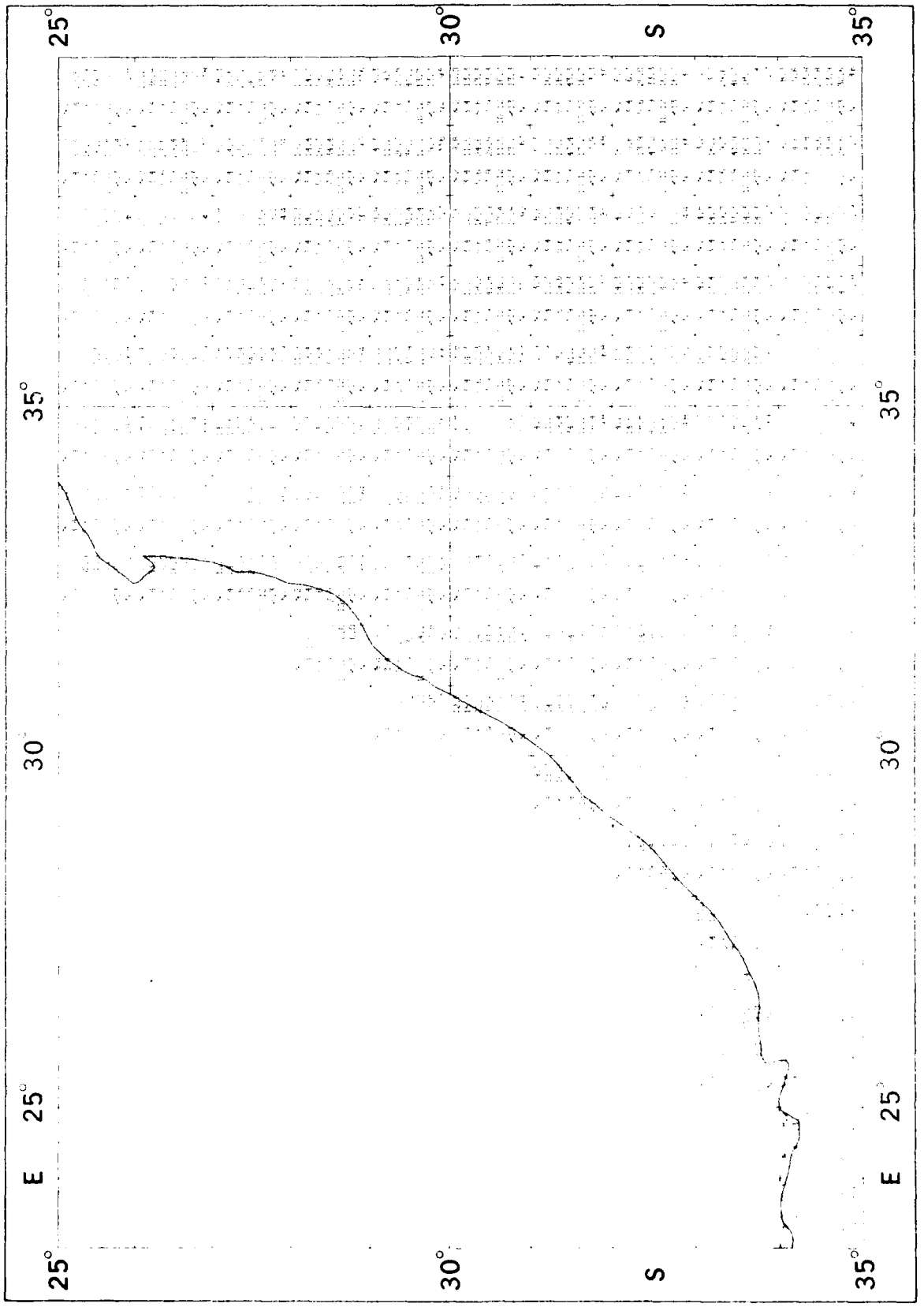


April

Wave Height

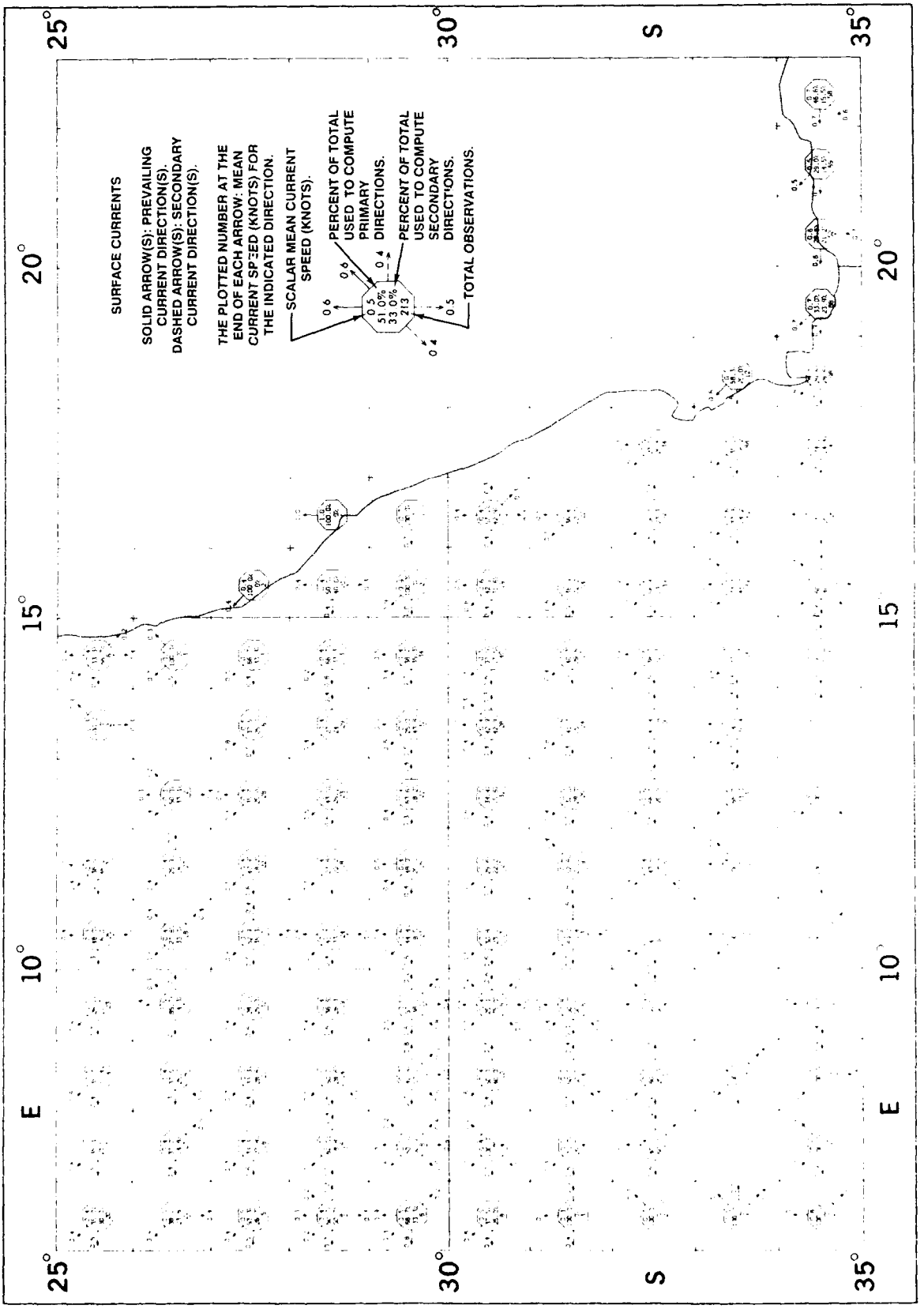


April **Wave Height**



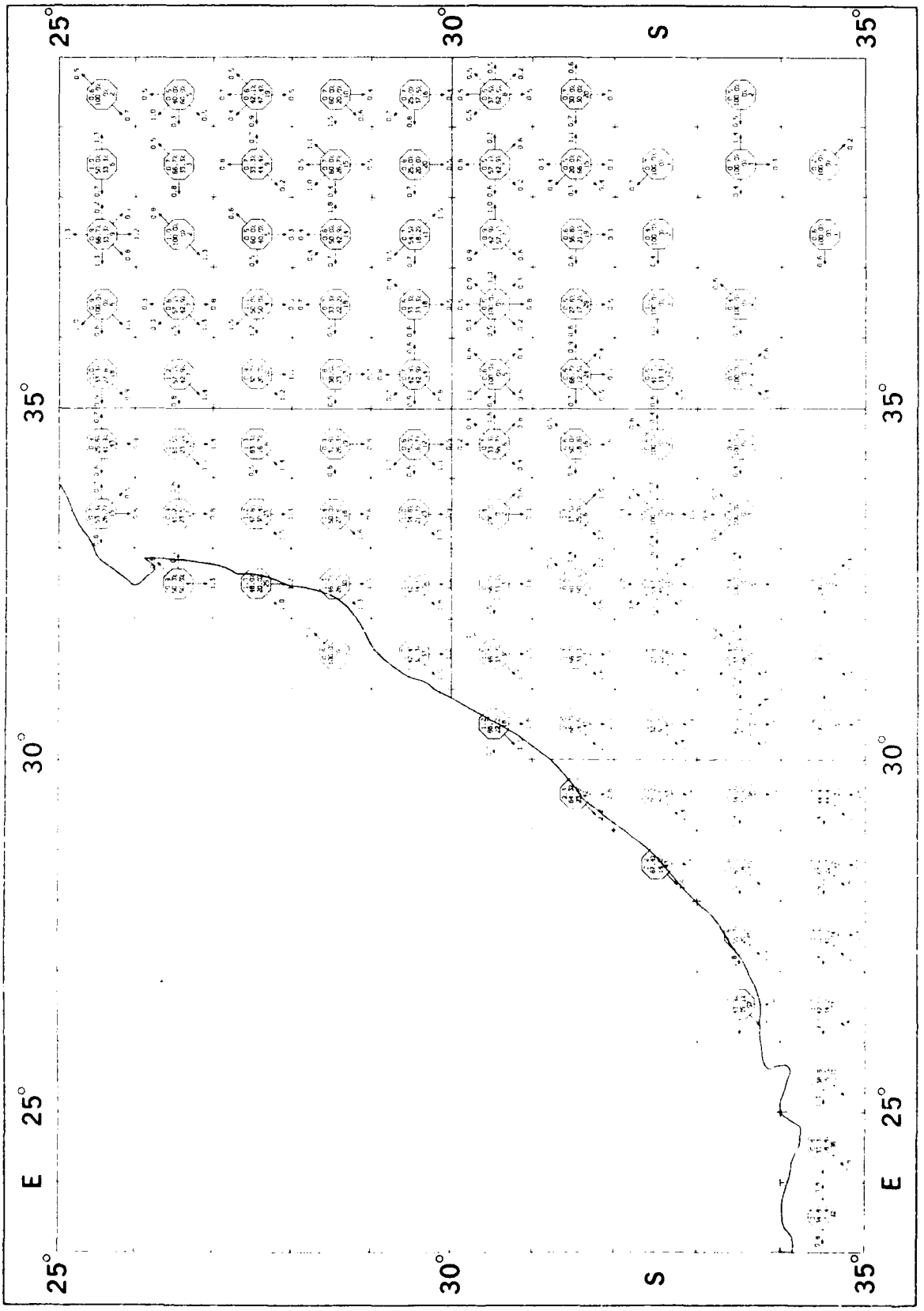
April

Surface Currents



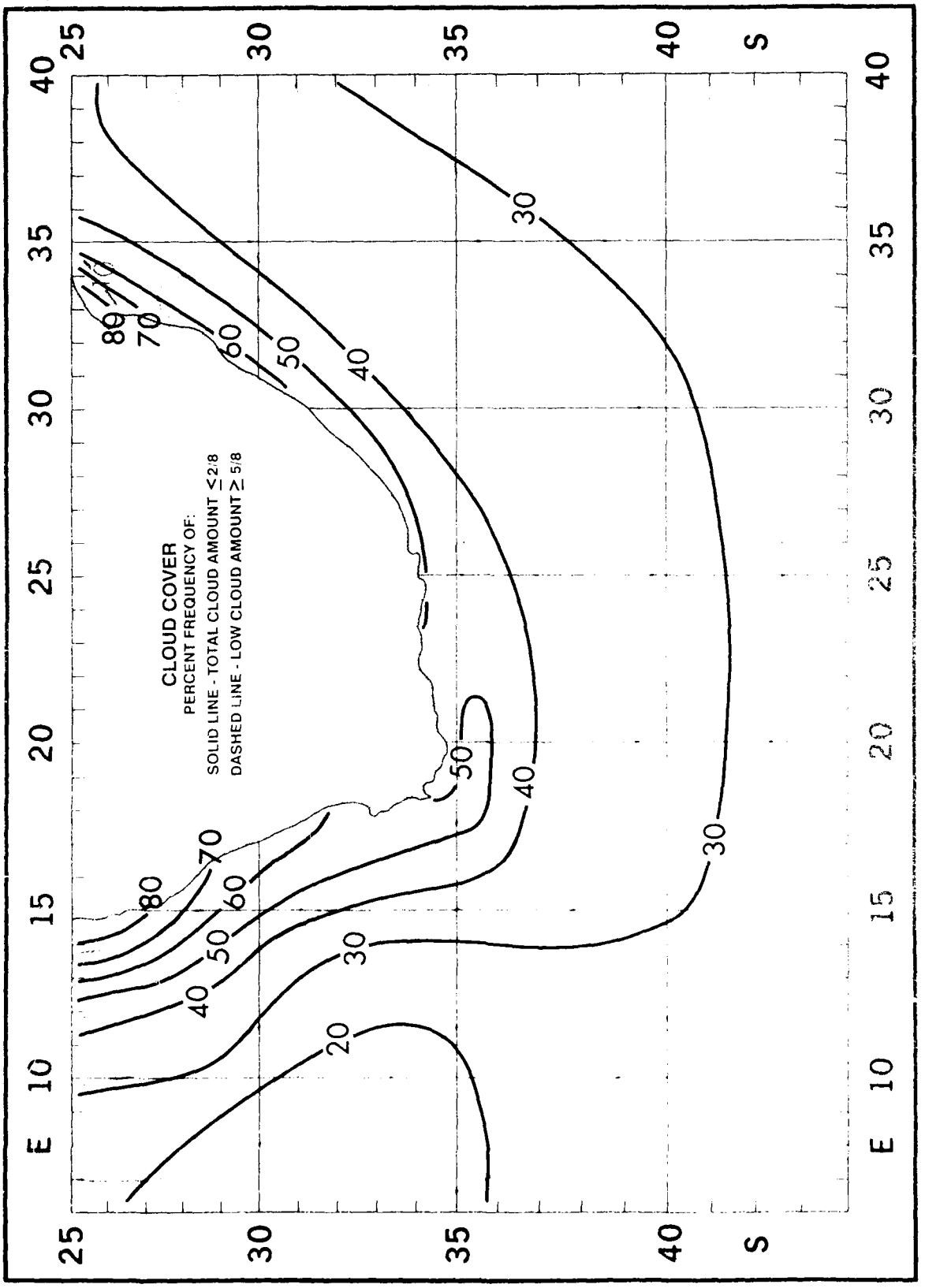
April

Surface Currents



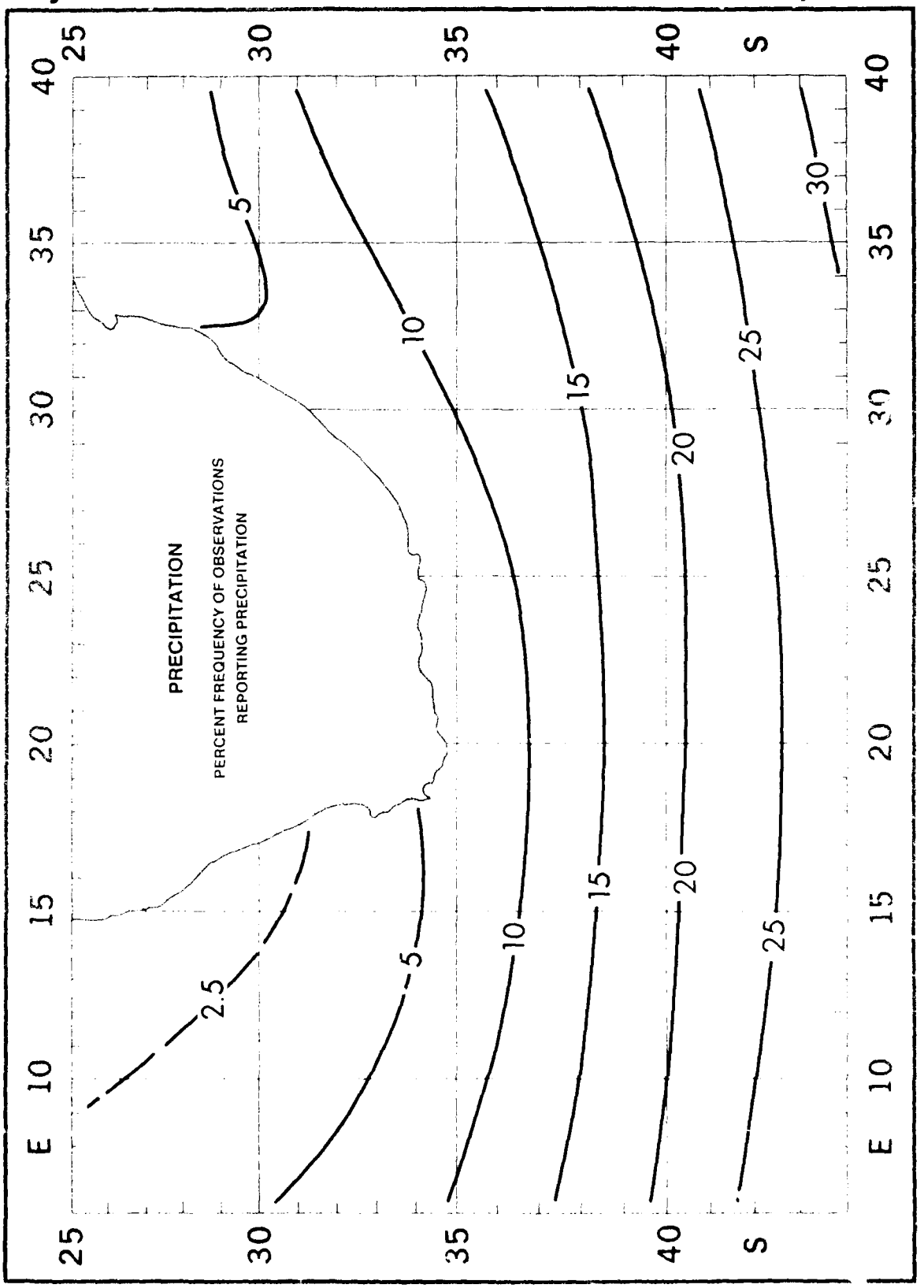
May

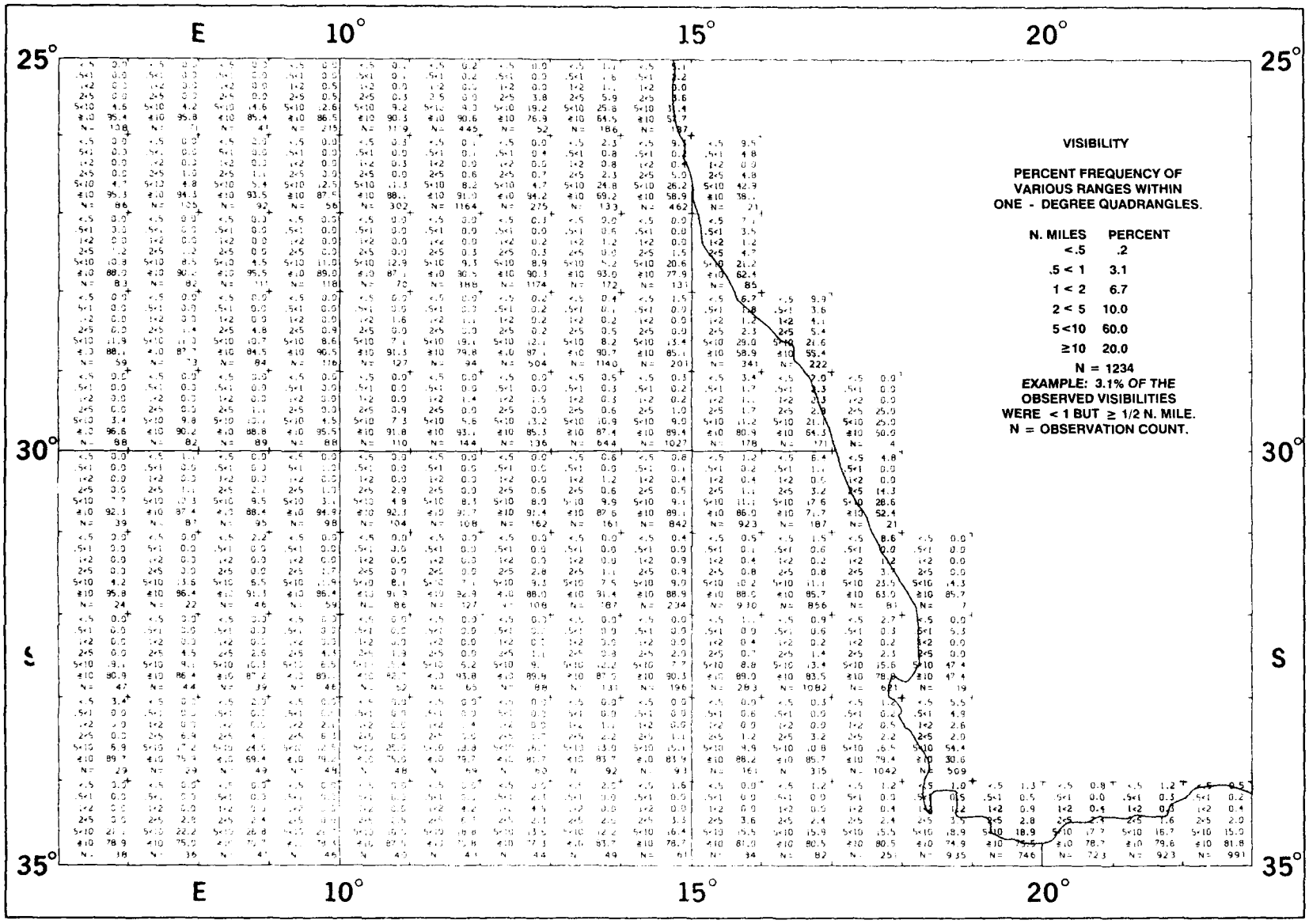
Clouds


CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE - TOTAL CLOUD AMOUNT ≤ 2/8
DASHED LINE - LOW CLOUD AMOUNT ≥ 5/8
80
70
60
50
40
30
20
E 10
15
20
25
30
35
40
S

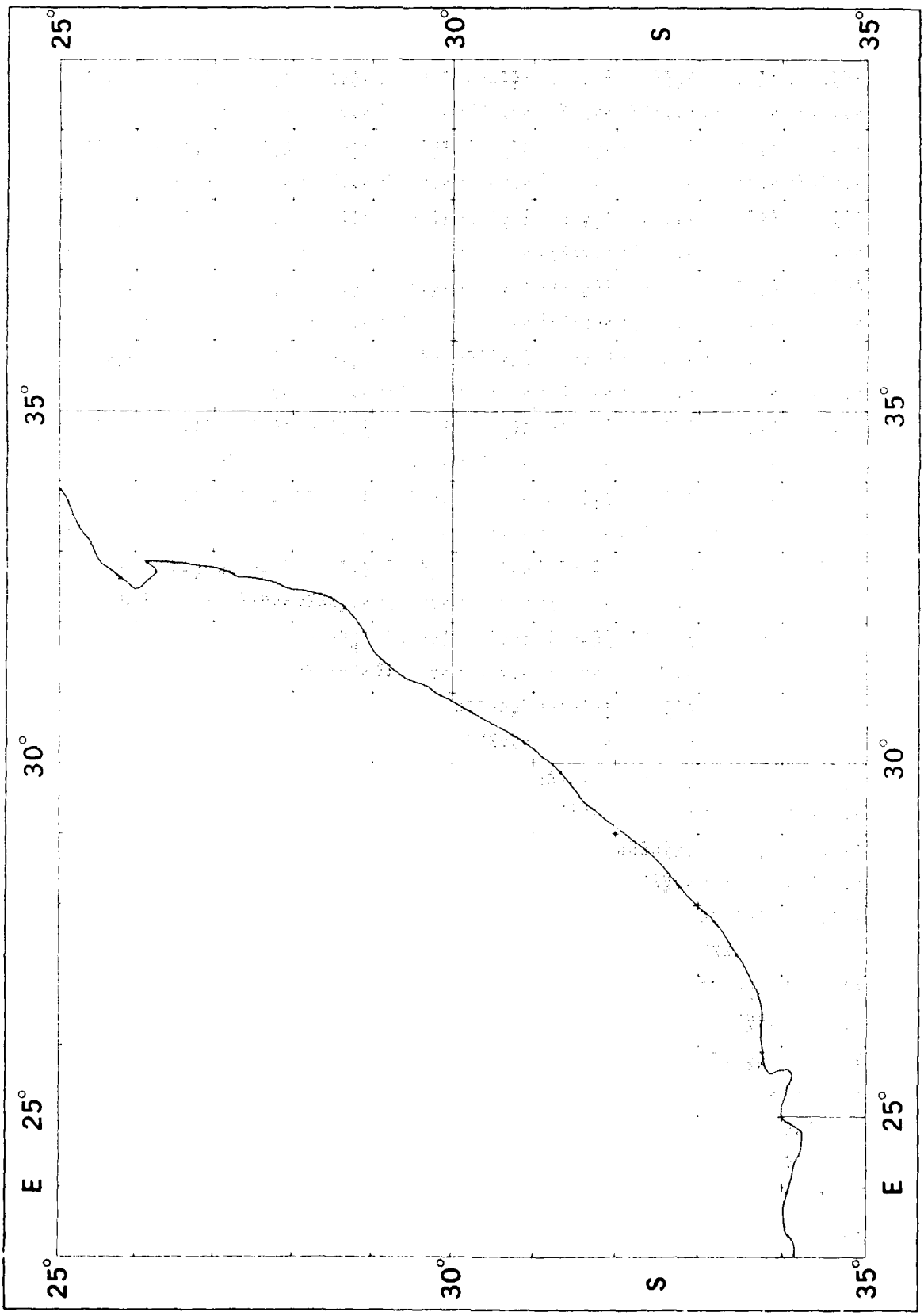
May

Precipitation



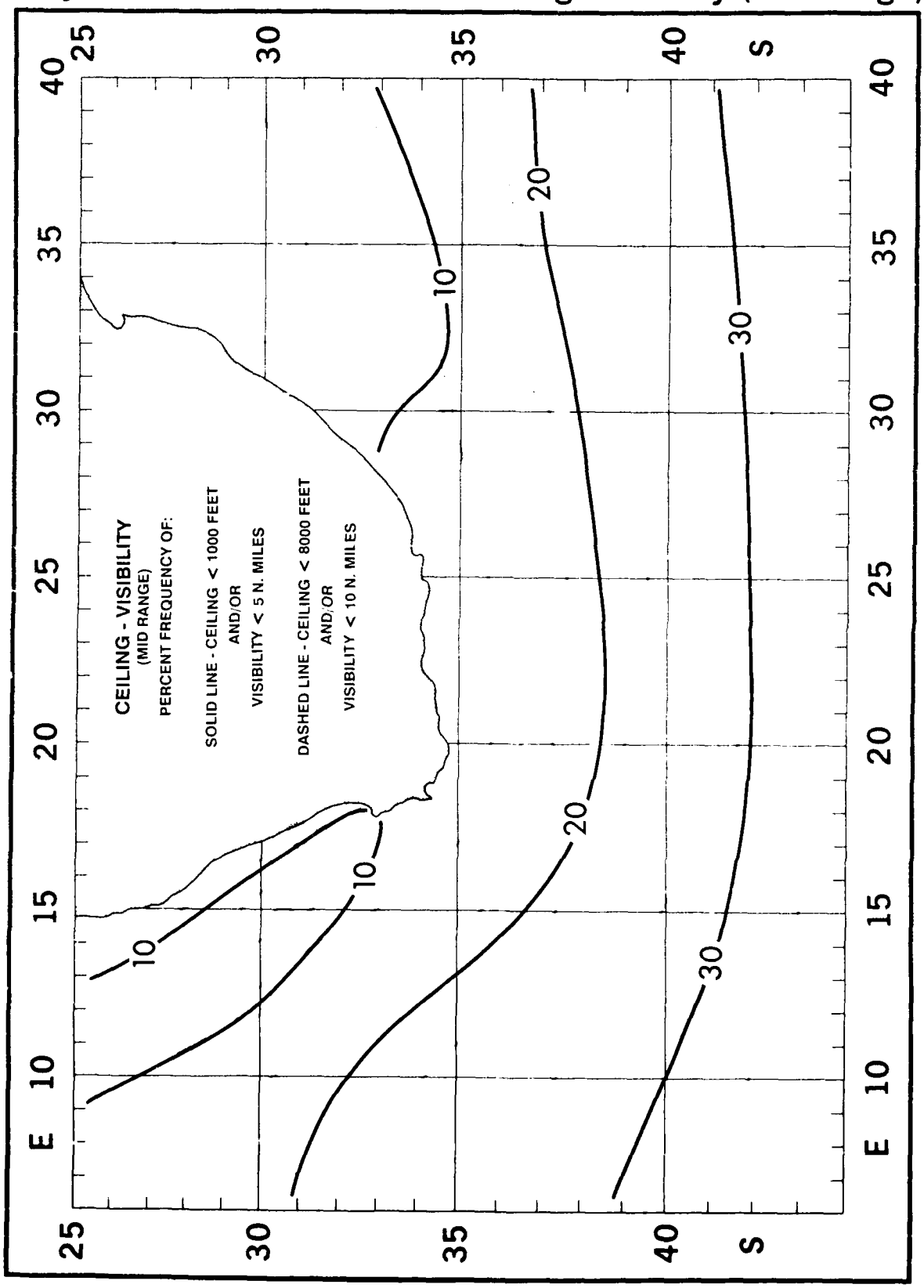

E
10°
15°
20°
25°
30°
35°
VISIBILITY
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE - DEGREE QUADRANGLES.
N. MILES PERCENT
<.5 .2
.5 < 1 3.1
1 < 2 6.7
2 < 5 10.0
5<10 60.0
≥10 20.0
N = 1234
EXAMPLE: 3.1% OF THE OBSERVED VISIBILITIES WERE < 1 BUT ≥ 1/2 N. MILE.
N = OBSERVATION COUNT.

May **Visibility**



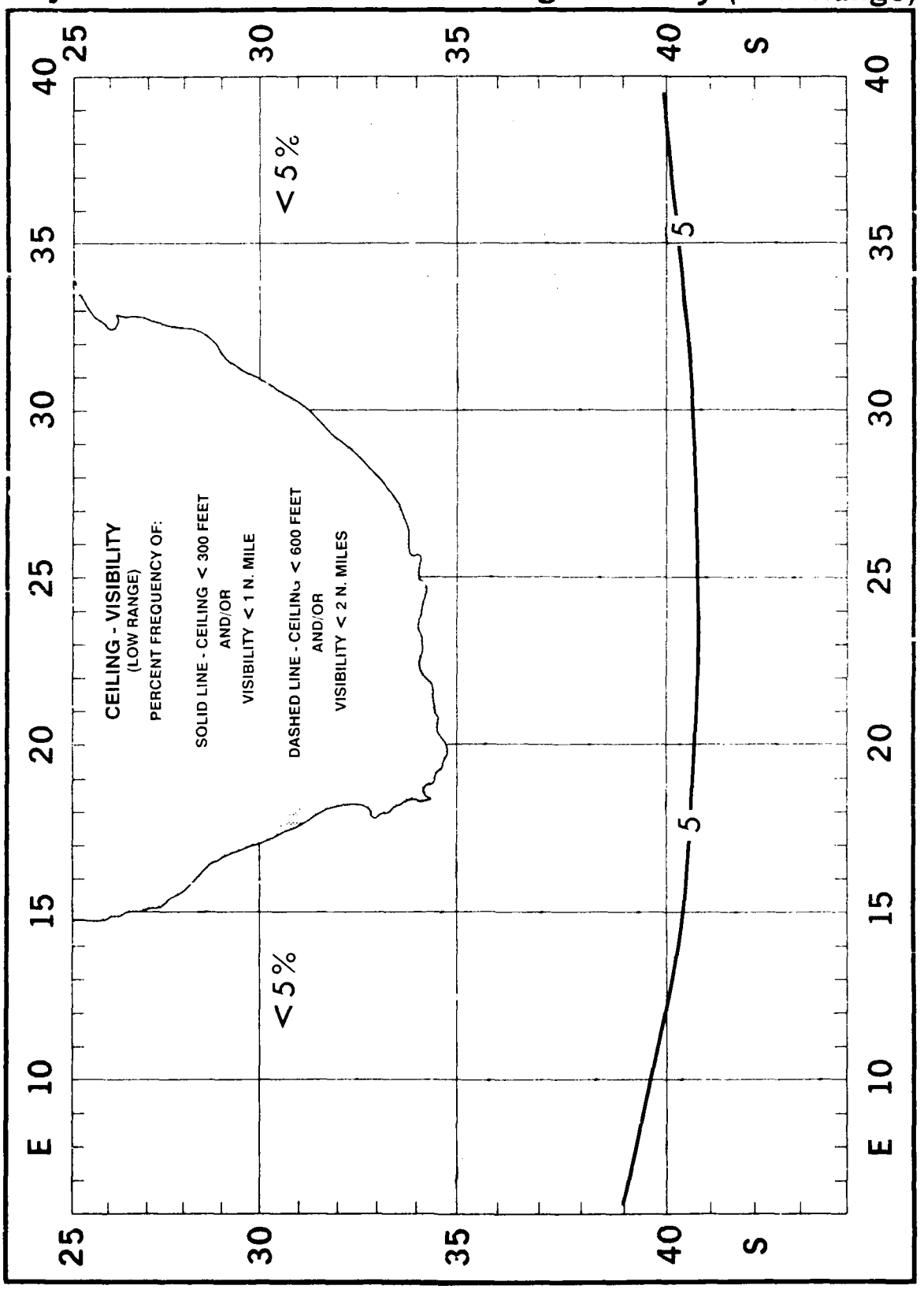
May

Ceiling - Visibility (Mid Range)

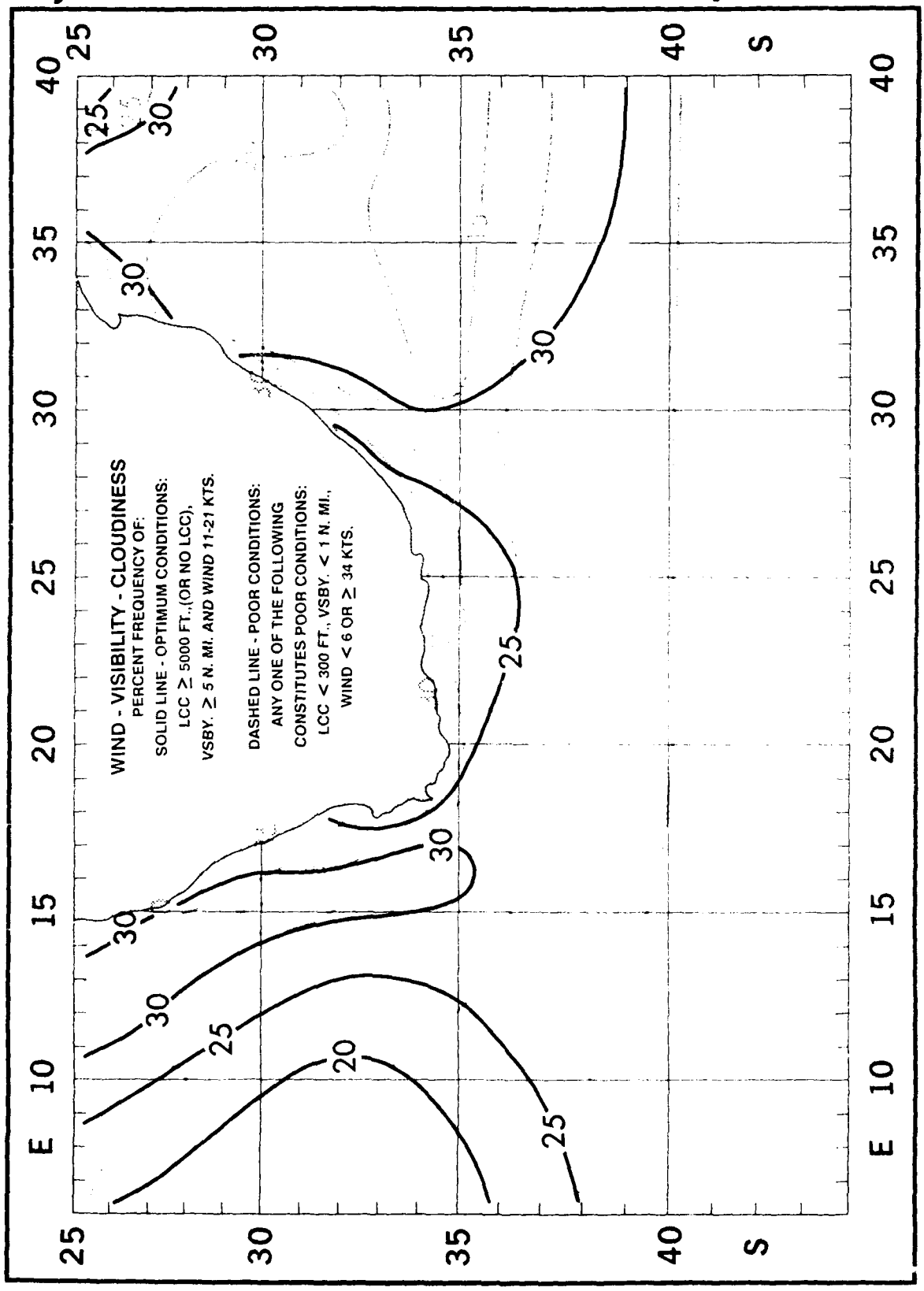


May

Ceiling - Visibility (Low Range)

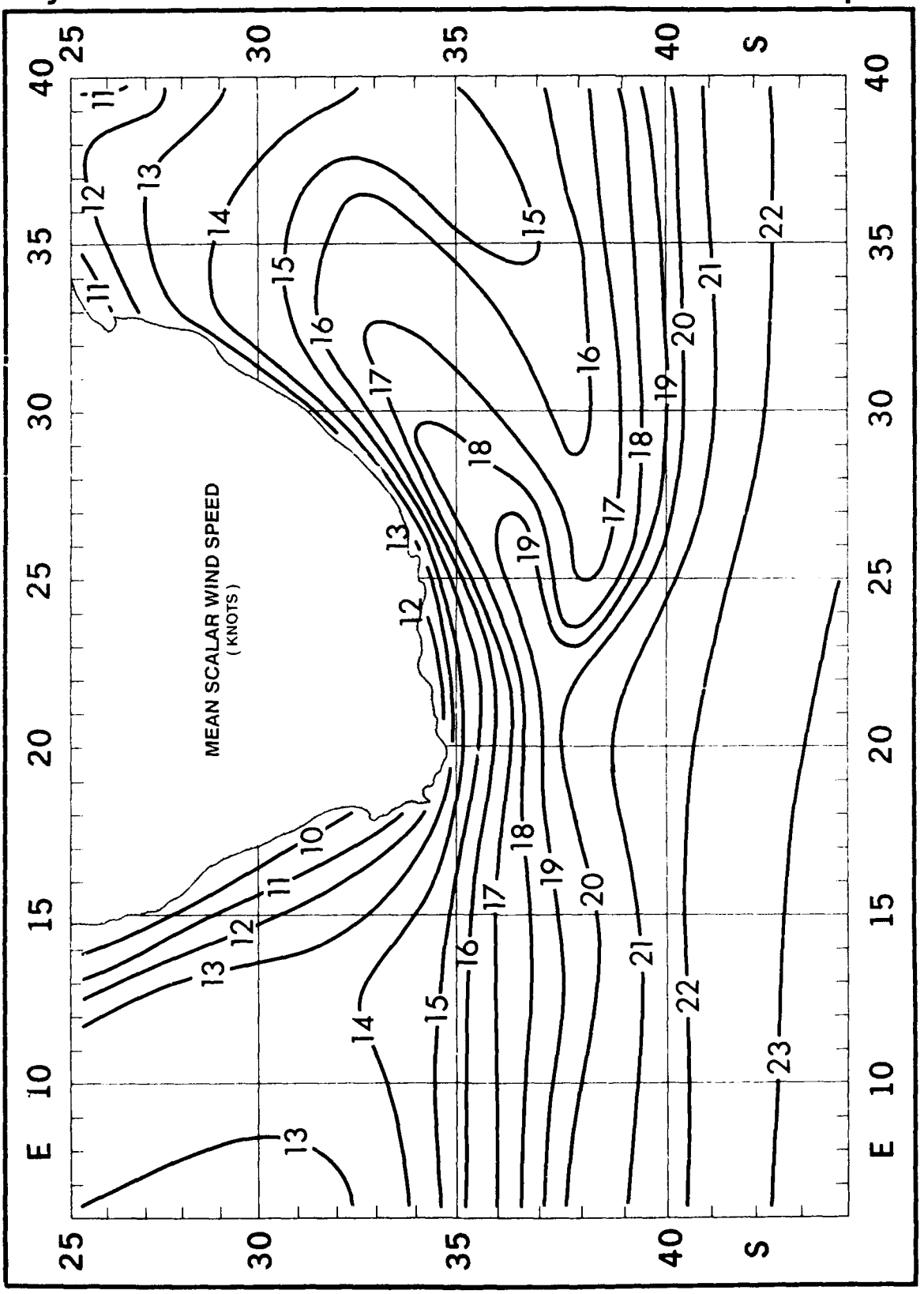


May **Wind - Visibility - Cloudiness**



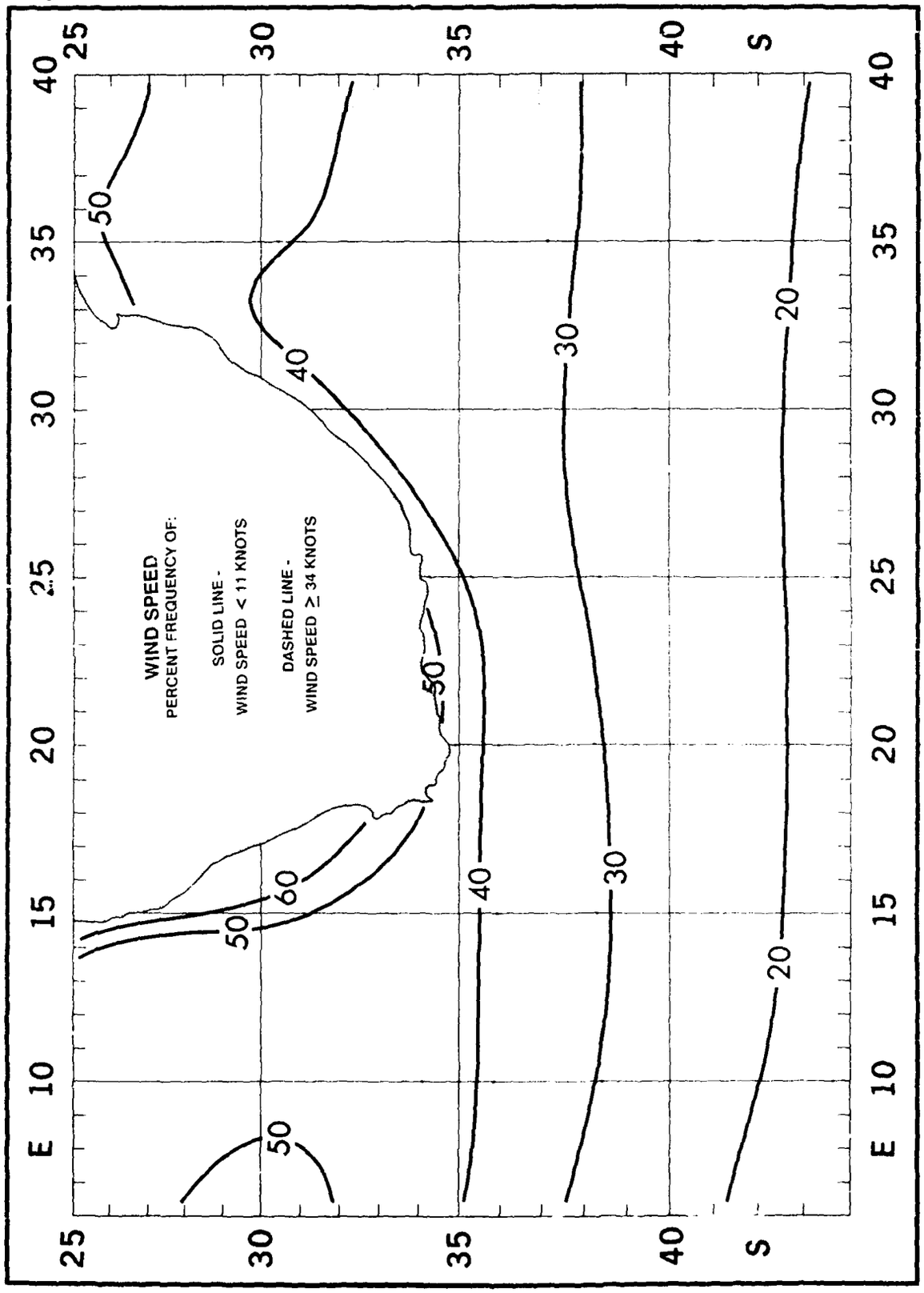
May

Mean Scalar Wind Speed

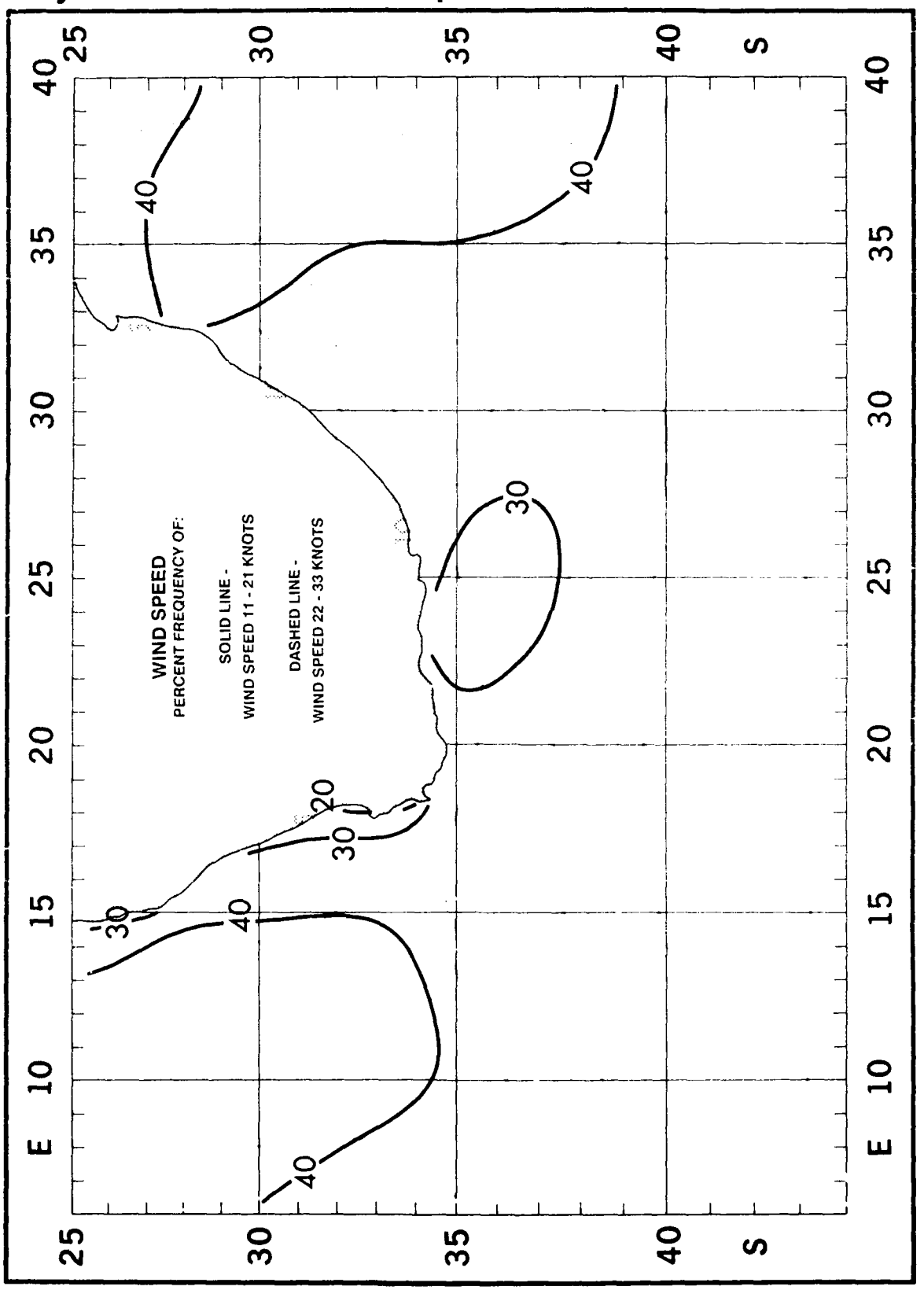


May

Wind Speed <11 and ≥34 Knots

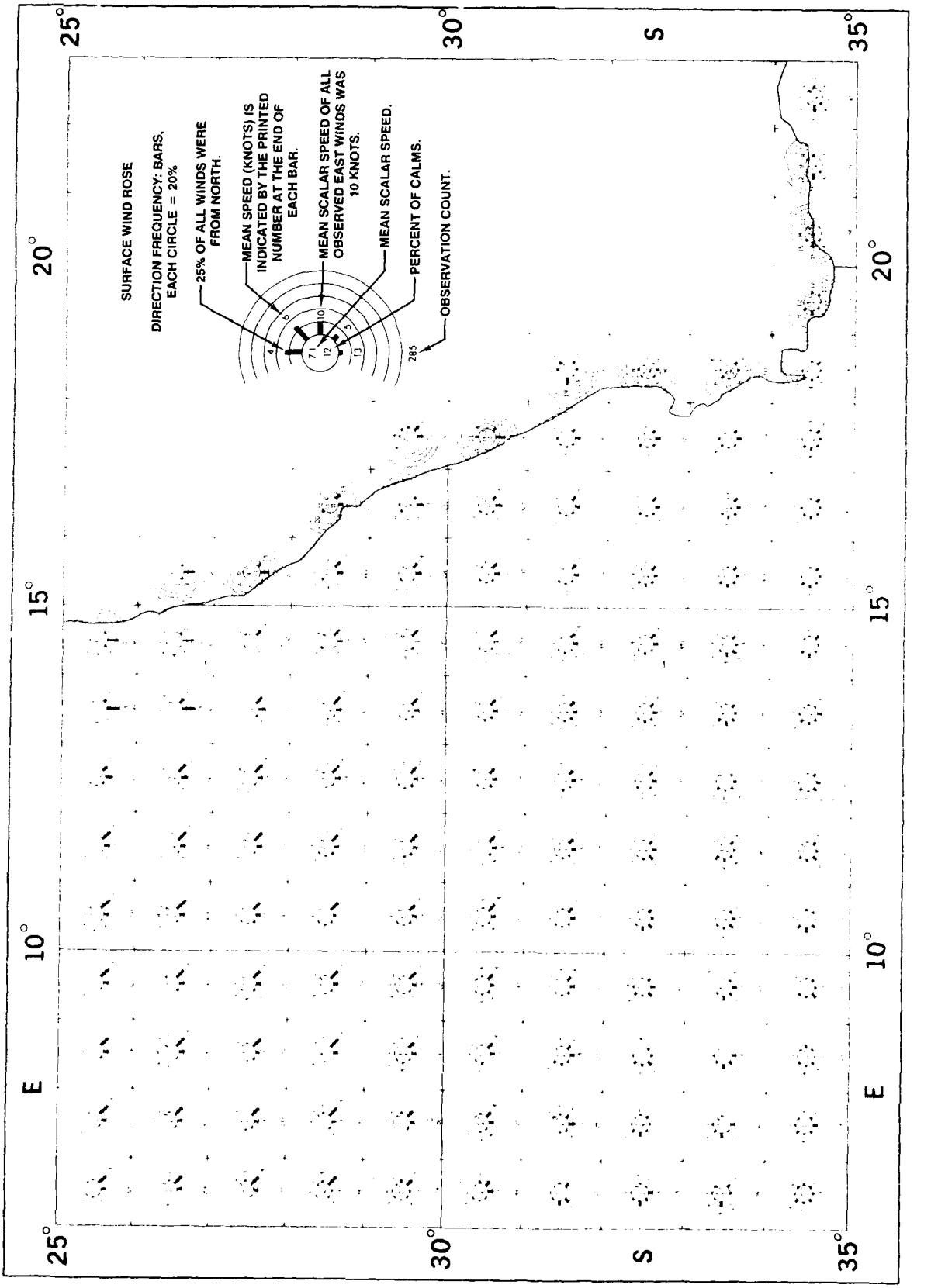


May **Wind Speed 11 - 21 and 22 - 33 Knots**



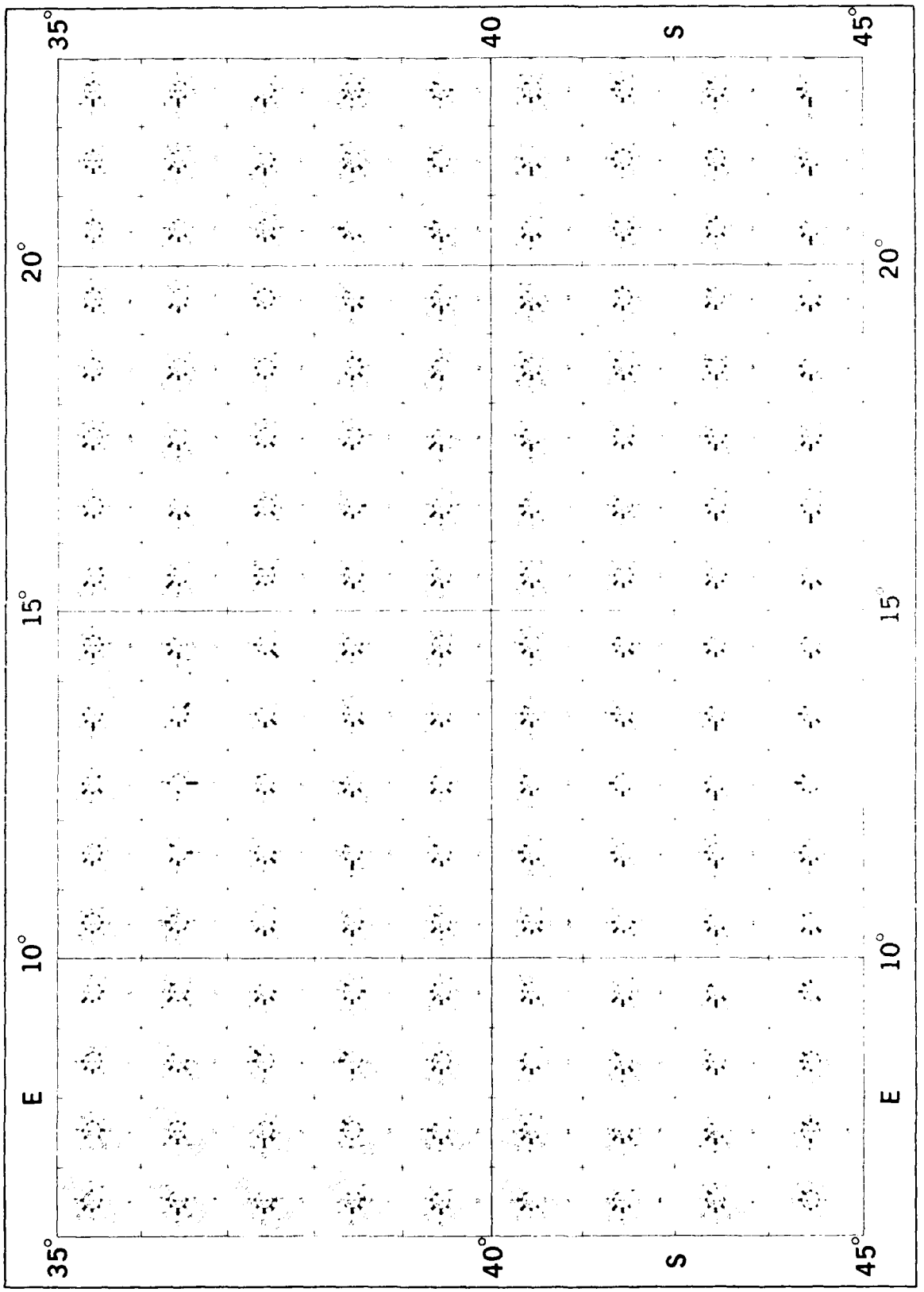
May

Surface Wind Roses



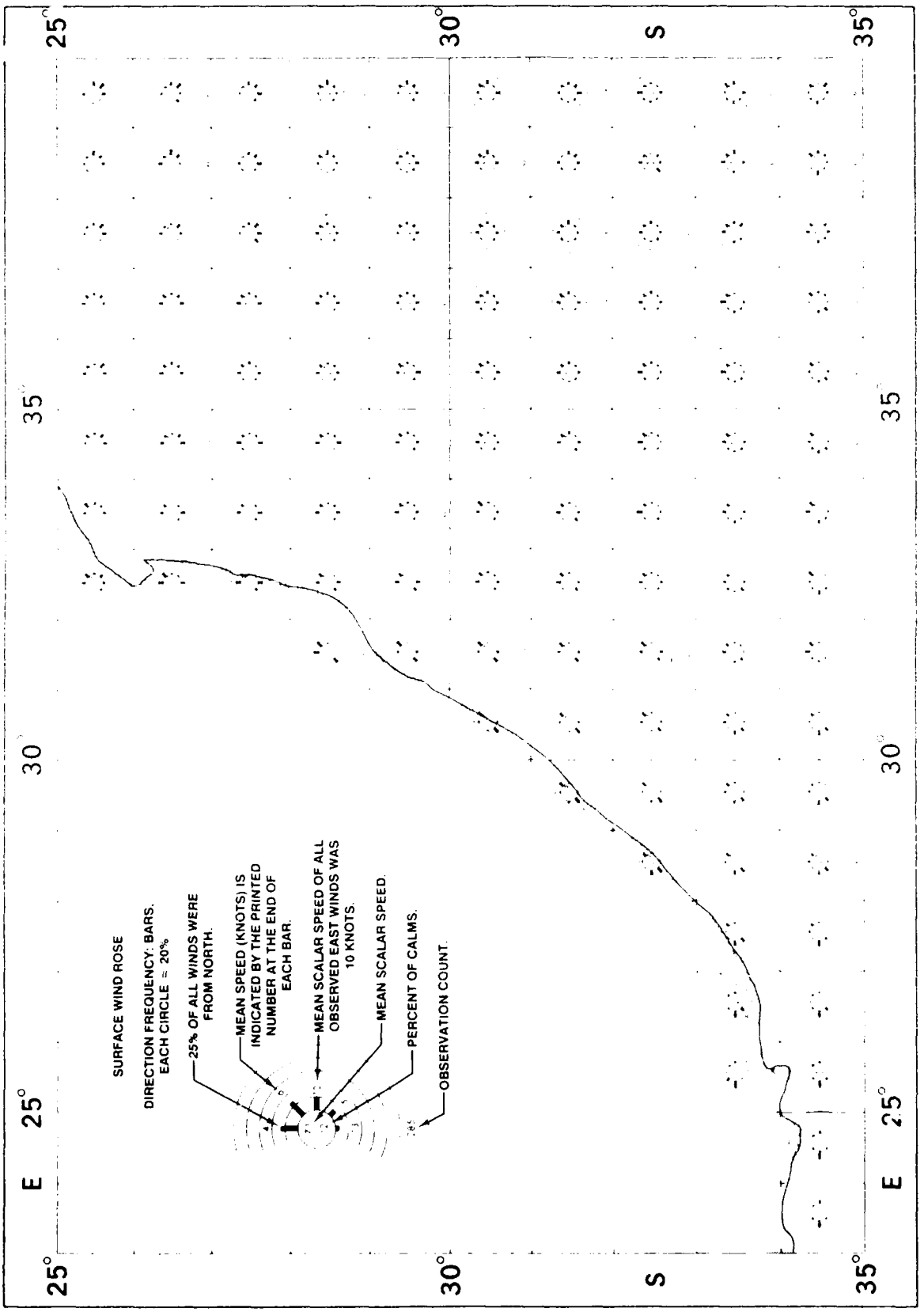
May

Surface Wind Roses



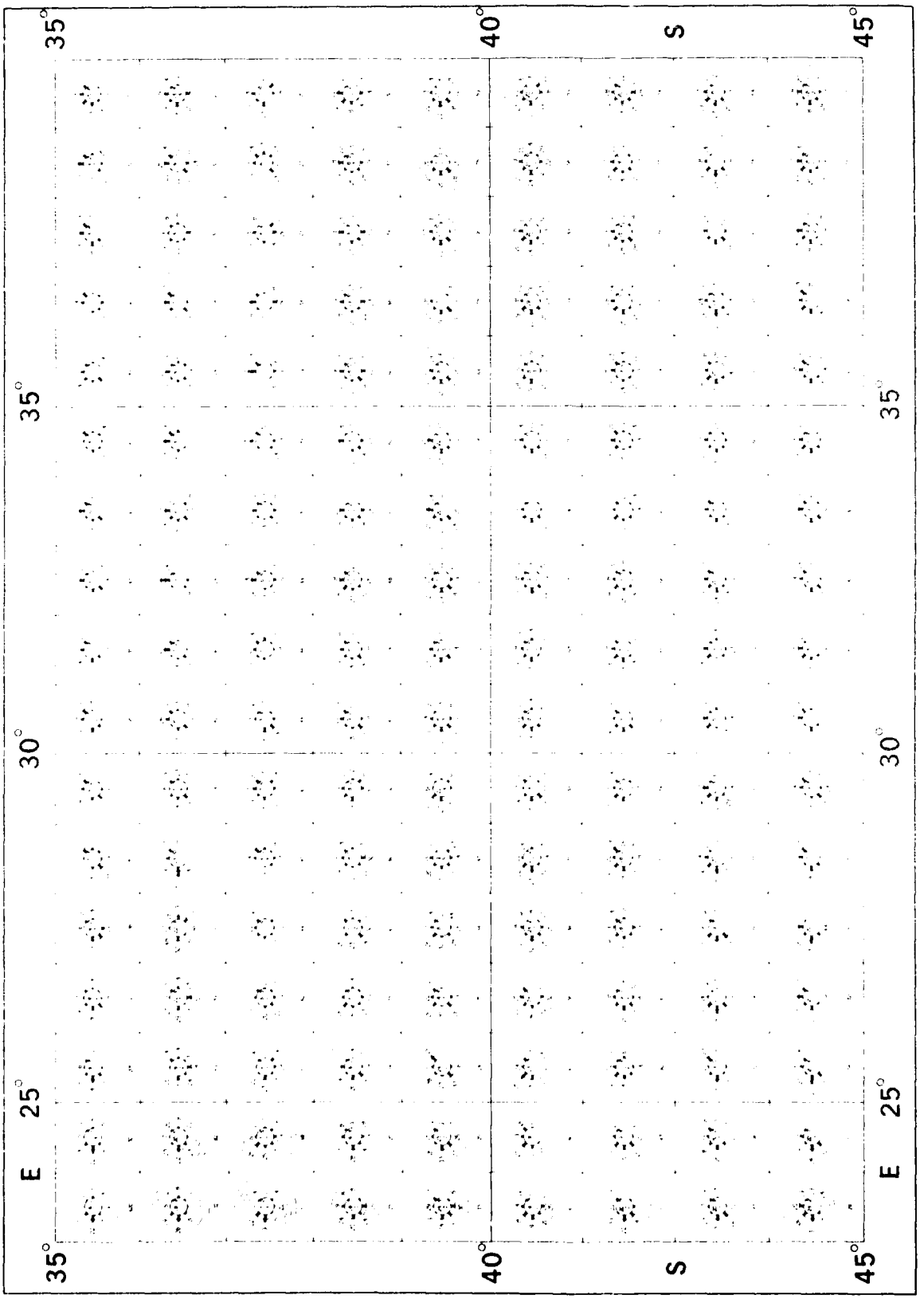
May

Surface Wind Roses

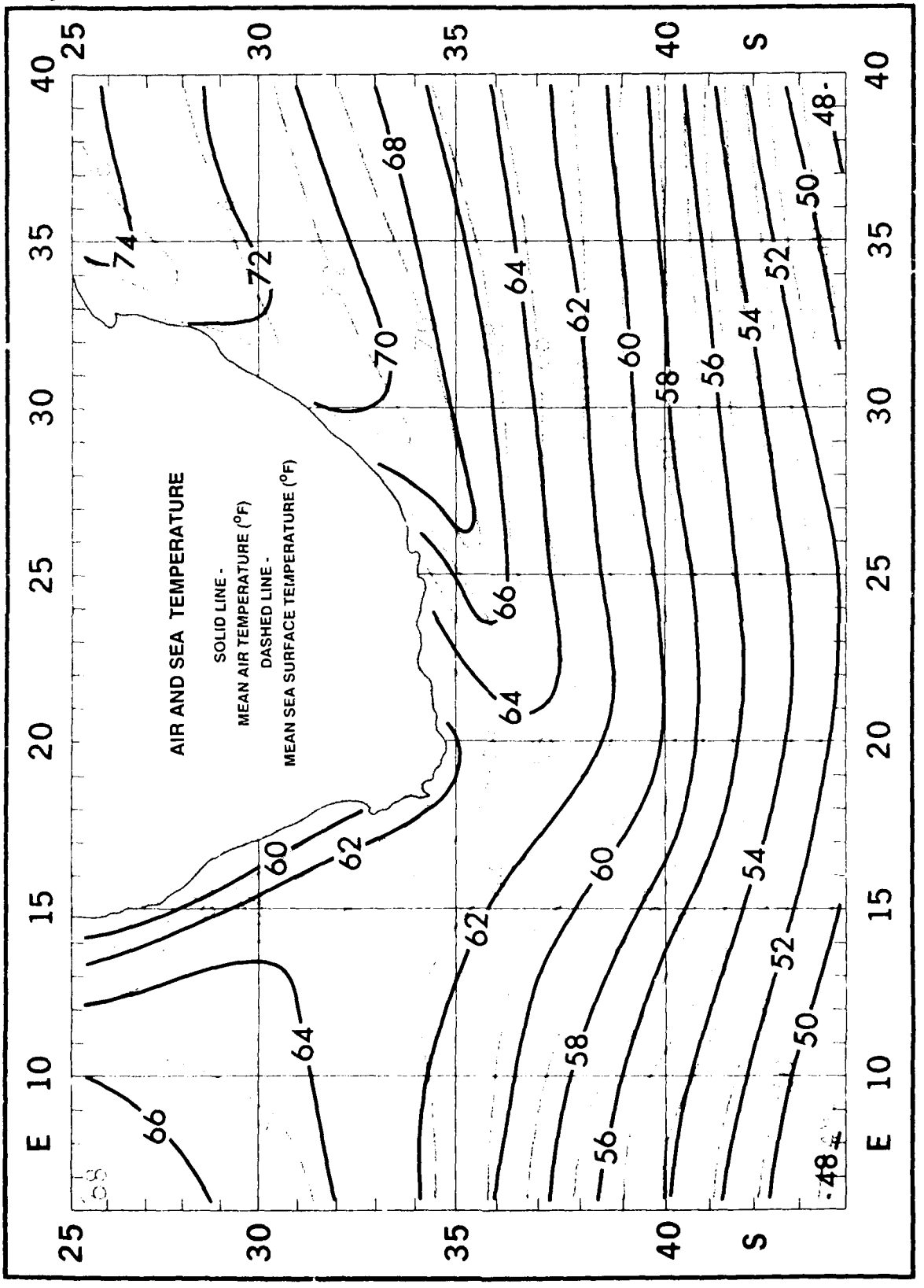


May

Surface Wind Roses

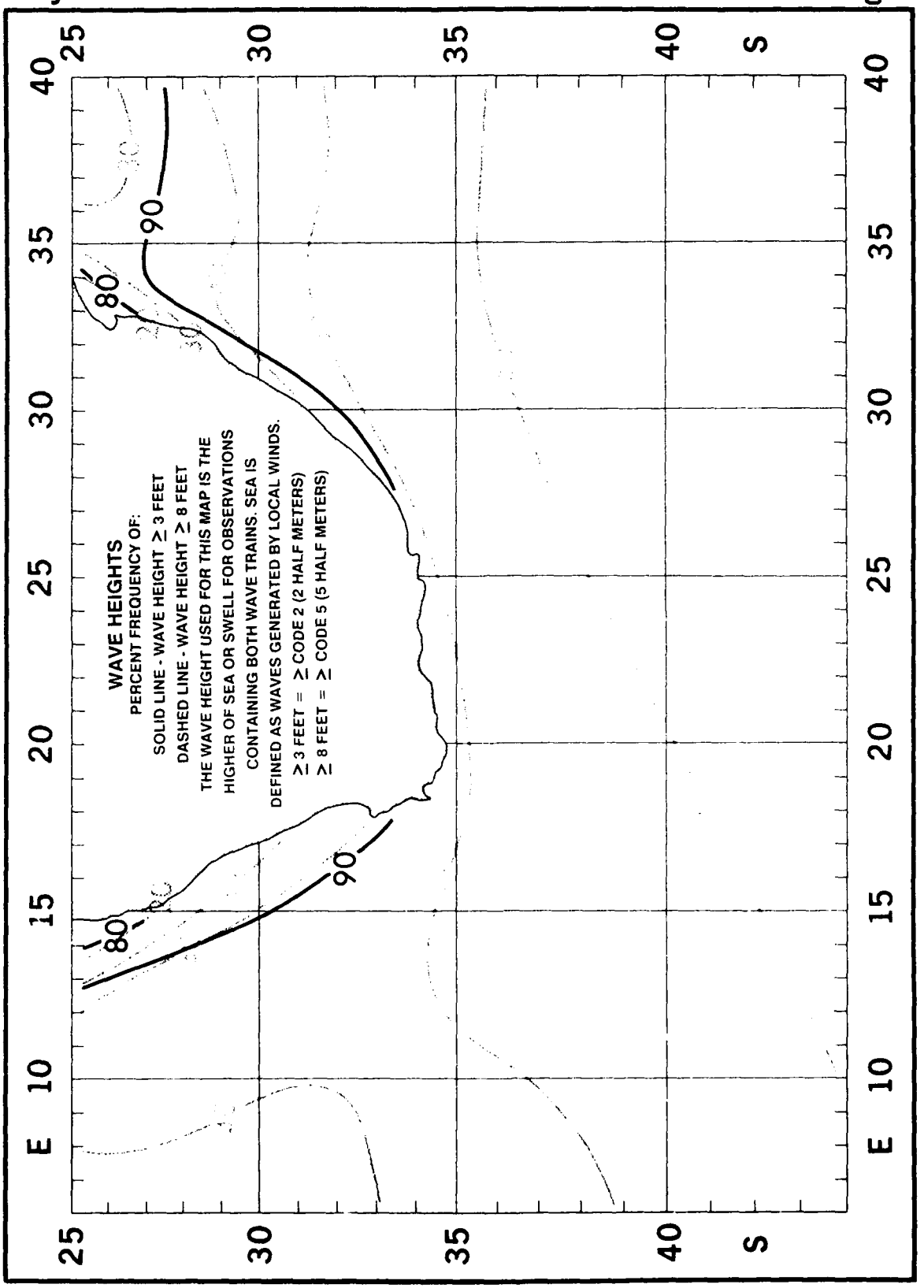


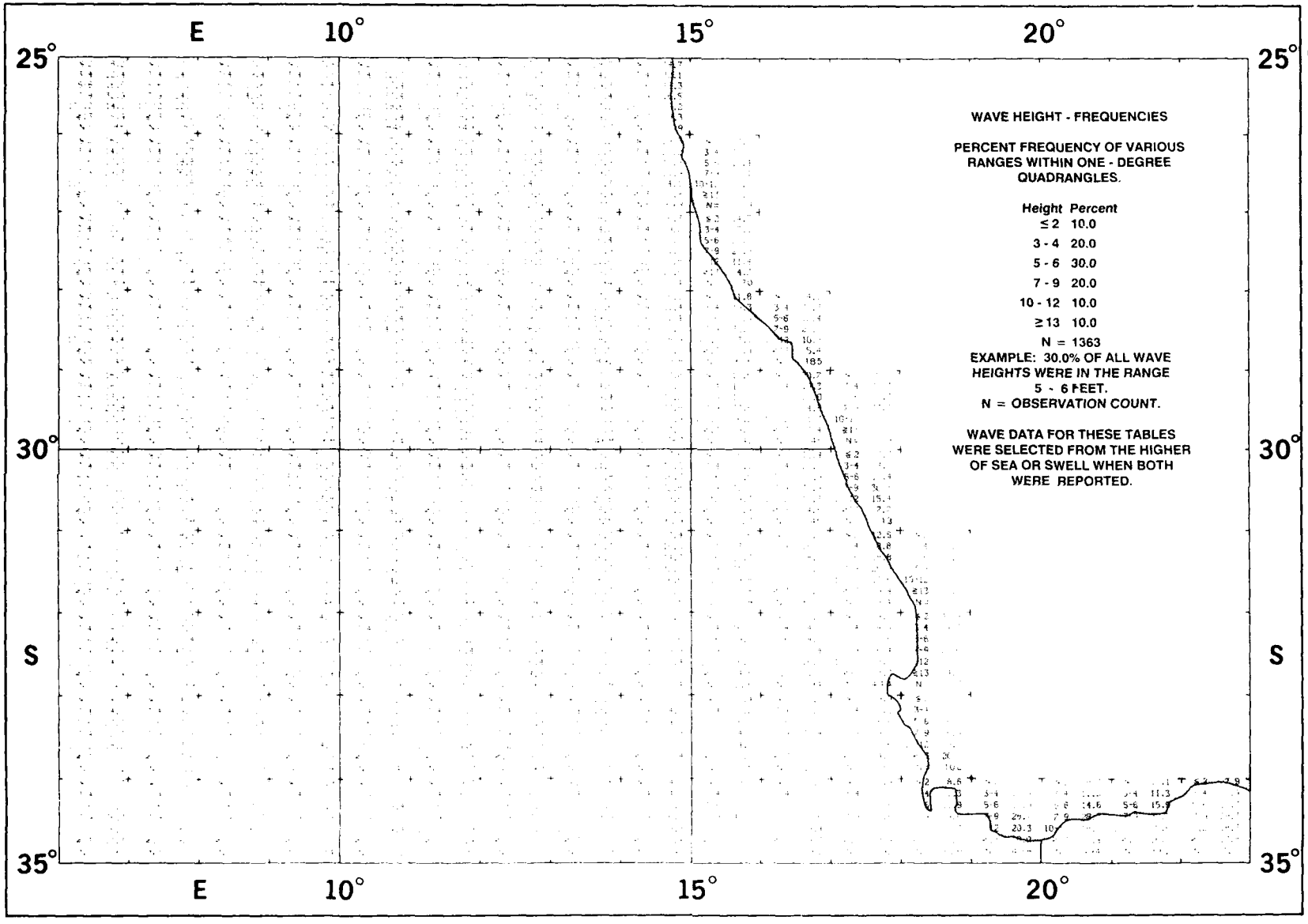
May **Air and Sea Temperature**



May

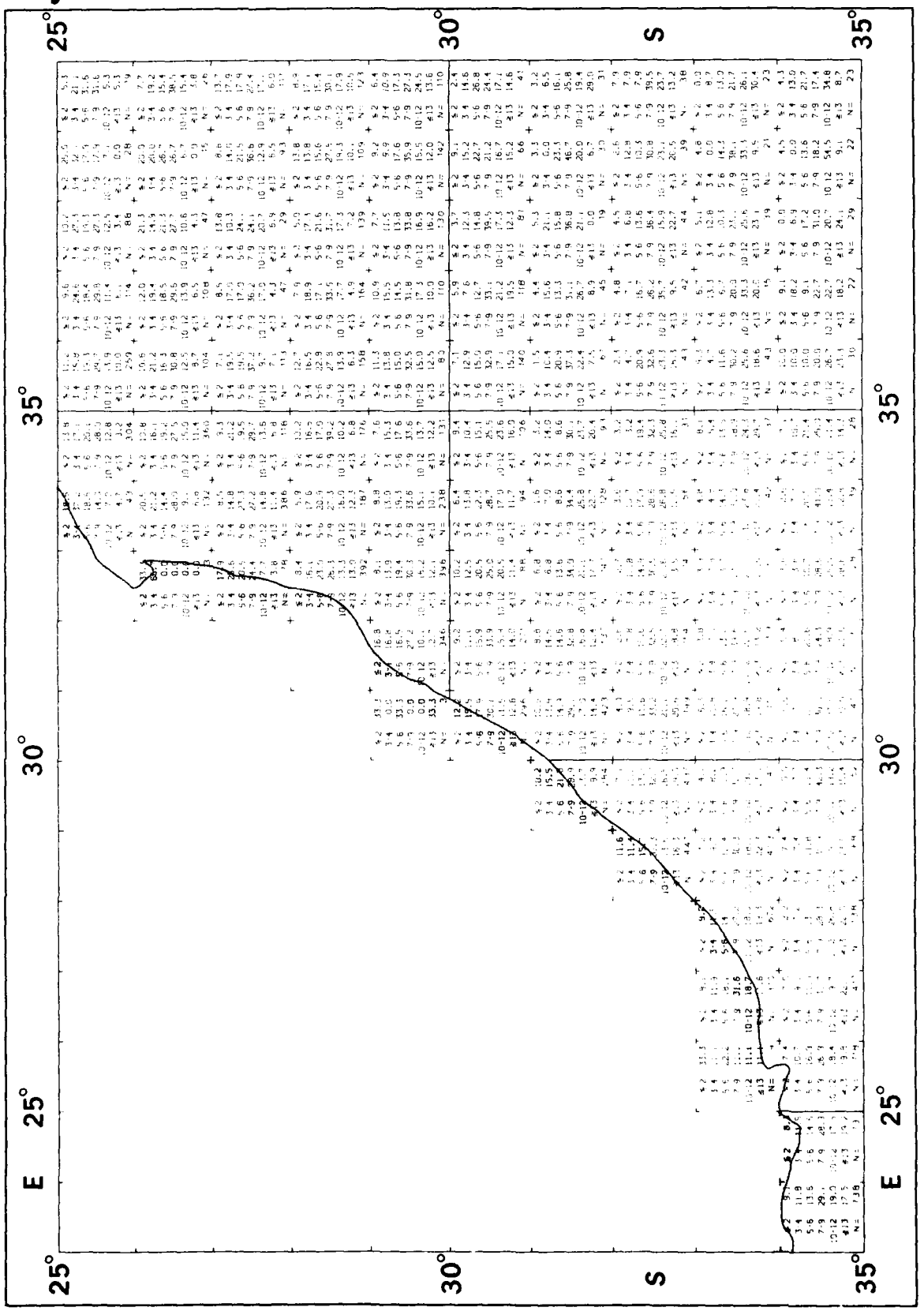
Wave Height




May
Wave Height
E
10°
15°
20°
25°
30°
35°
S
WAVE HEIGHT - FREQUENCIES
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE - DEGREE QUADRANGLES.
Height Percent
≤ 2 10.0
3 - 4 20.0
5 - 6 30.0
7 - 9 20.0
10 - 12 10.0
≥ 13 10.0
N = 1363
EXAMPLE: 30.0% OF ALL WAVE HEIGHTS WERE IN THE RANGE 5 - 6 FEET.
N = OBSERVATION COUNT.
WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.

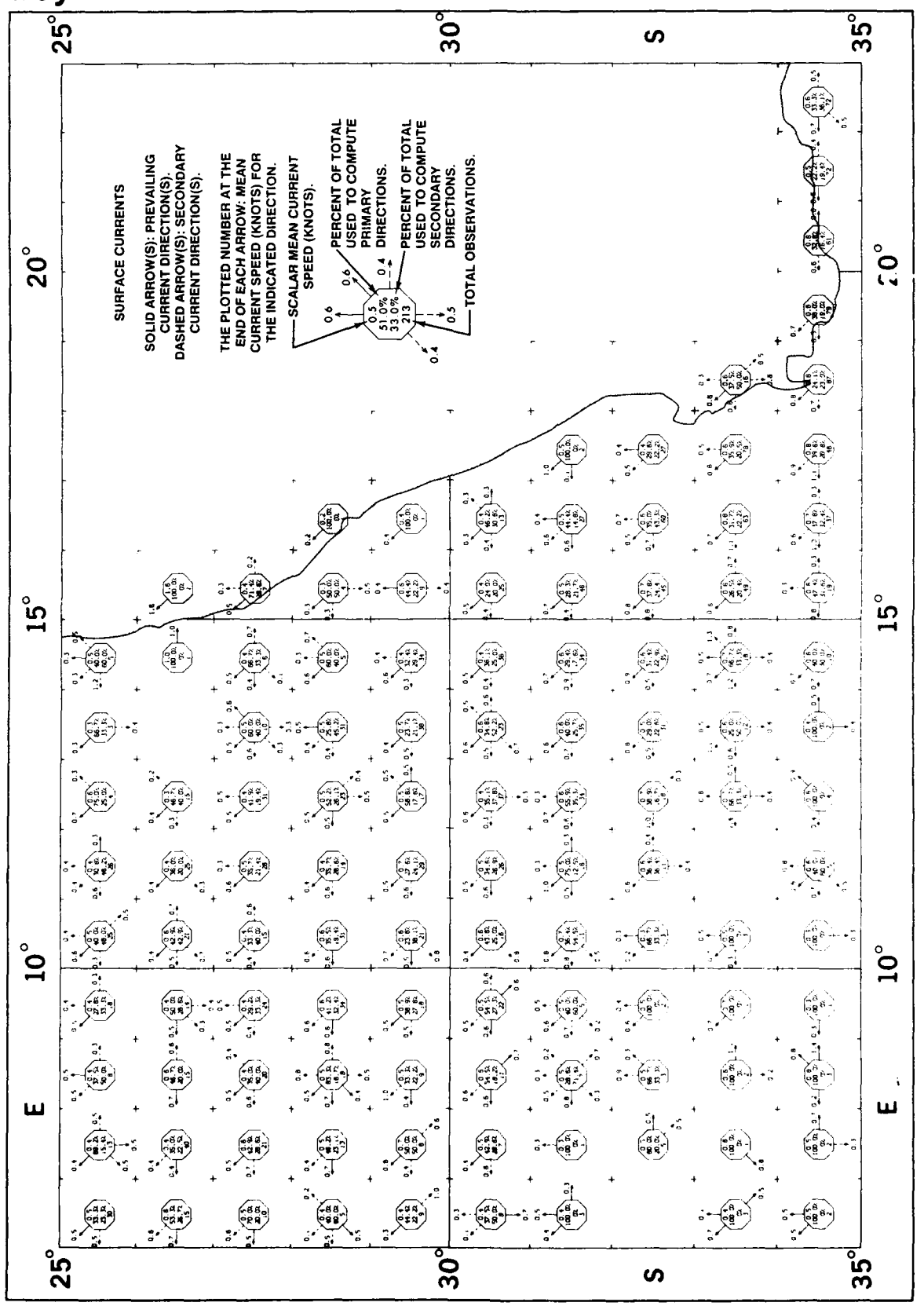
May

Wave Height



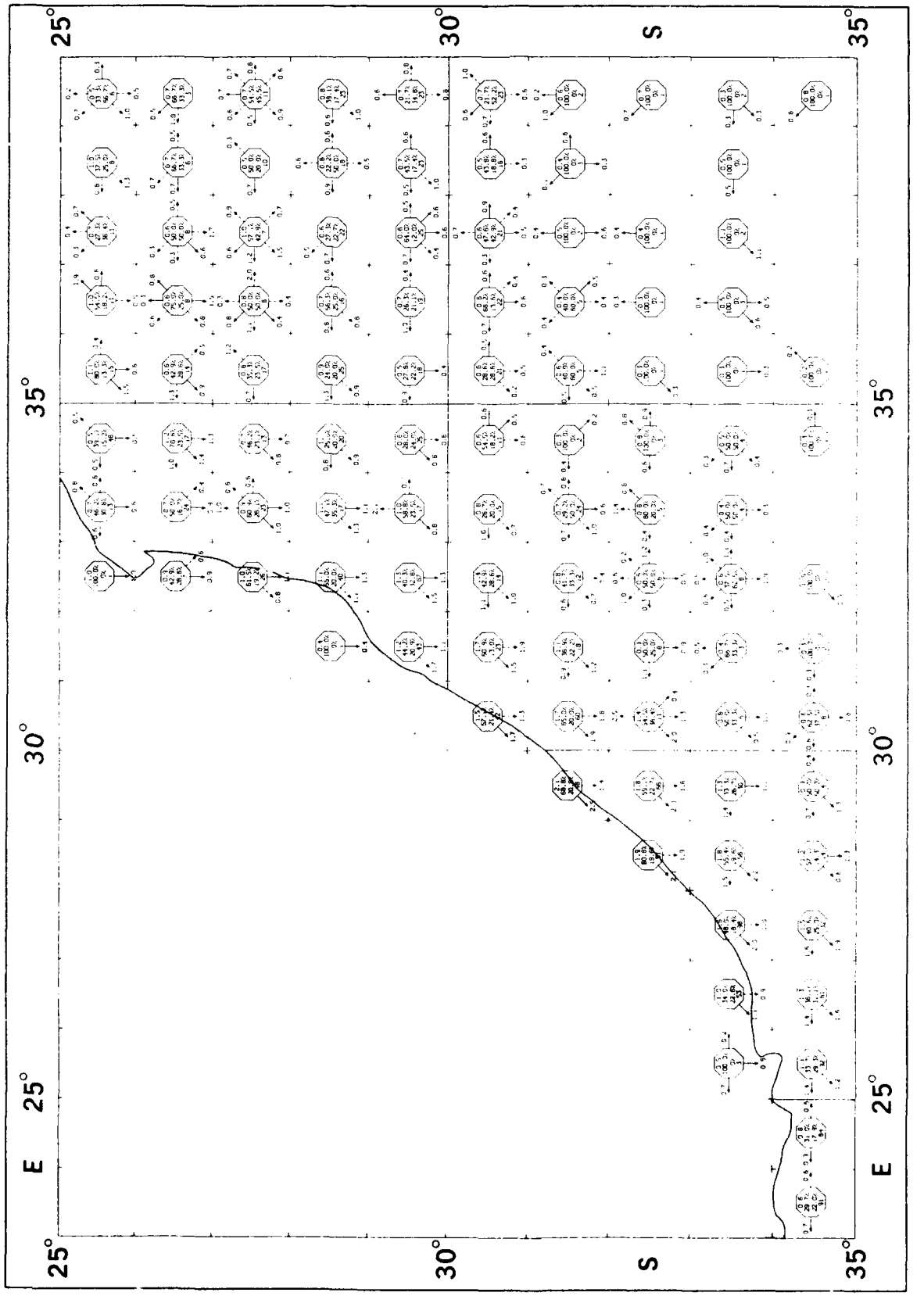
May

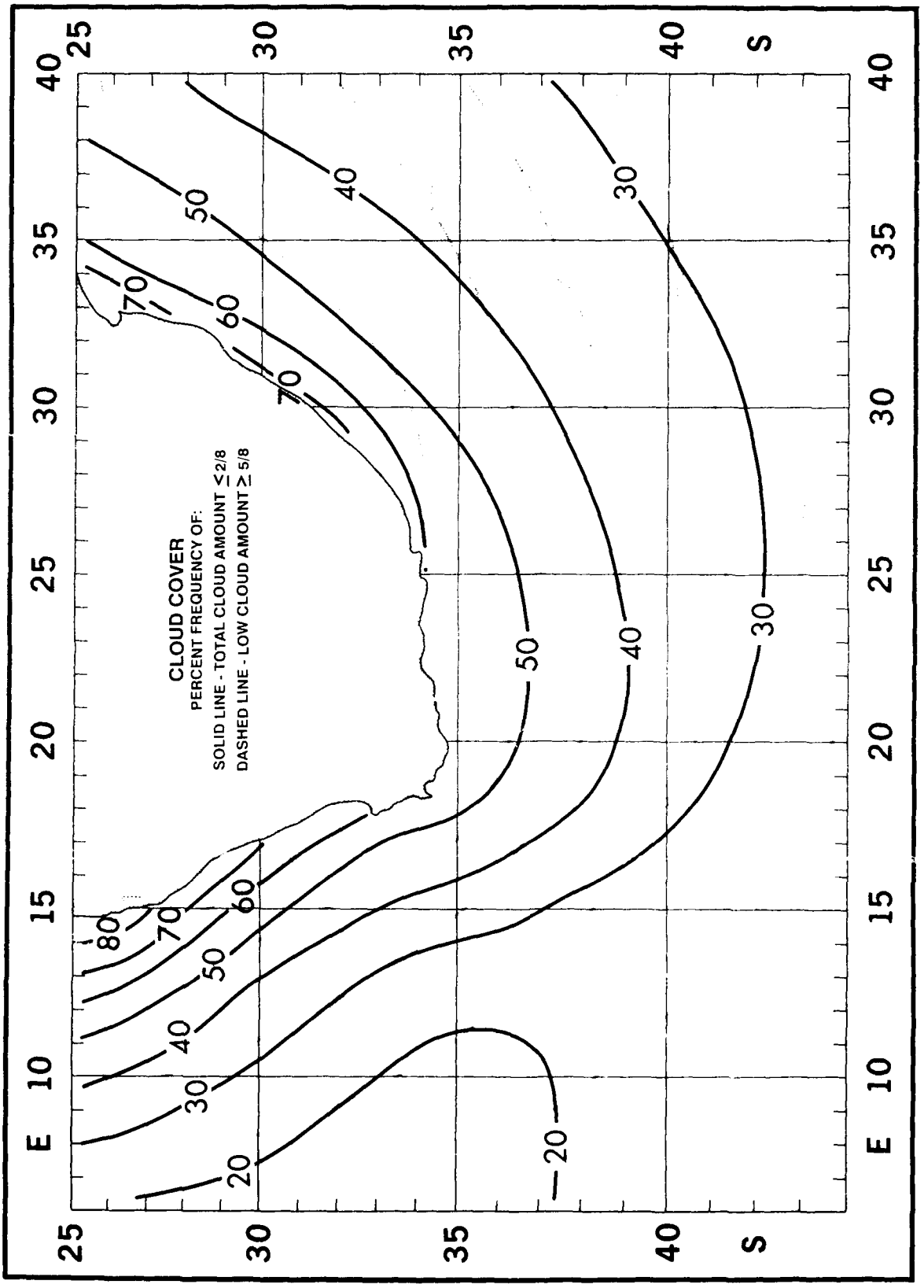
Surface Currents



May

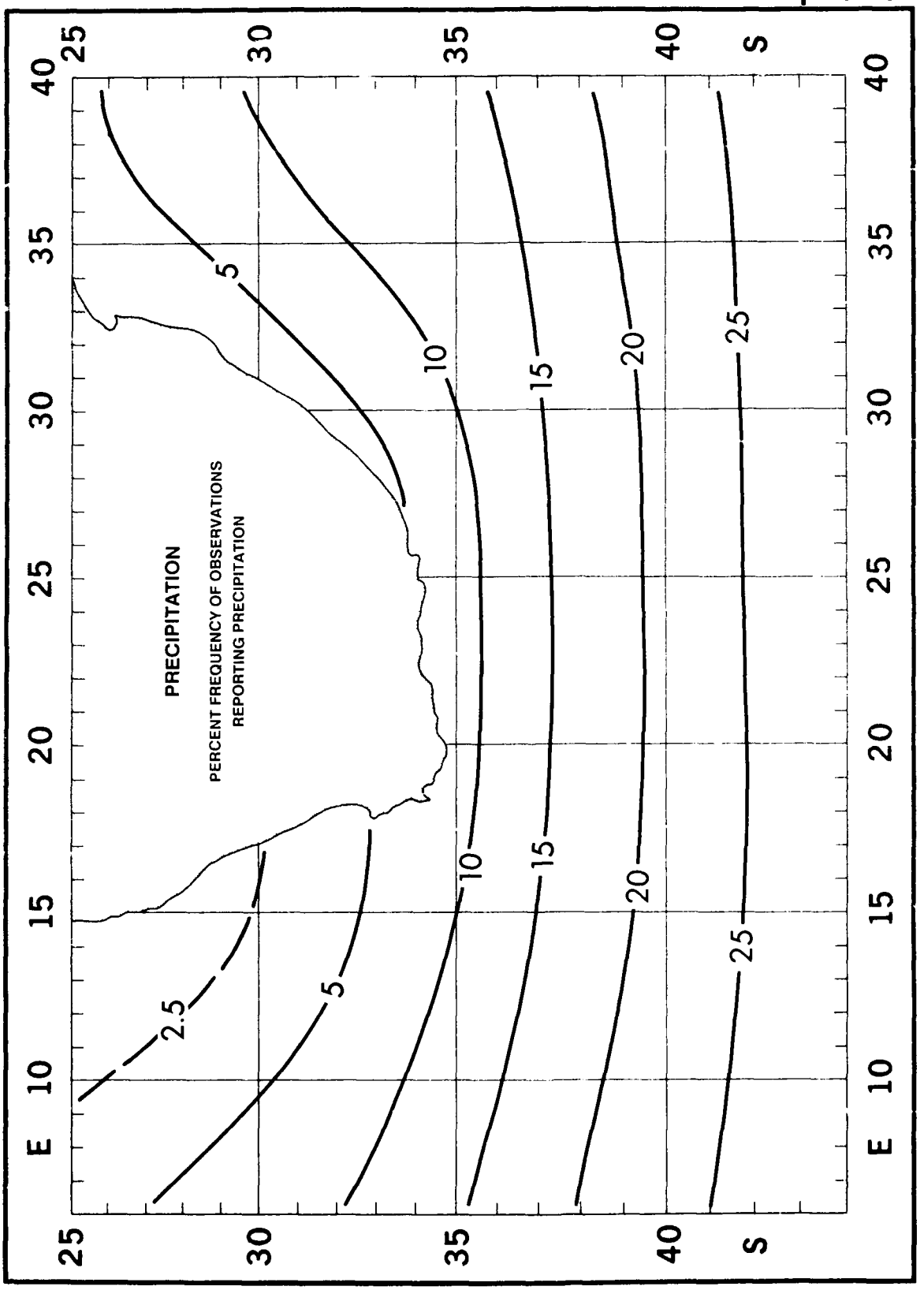
Surface Currents




CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE - TOTAL CLOUD AMOUNT ≤ 2/8
DASHED LINE - LOW CLOUD AMOUNT ≥ 5/8
80
70
60
50
40
30
20
E
S
25
30
35
40
10
15
20

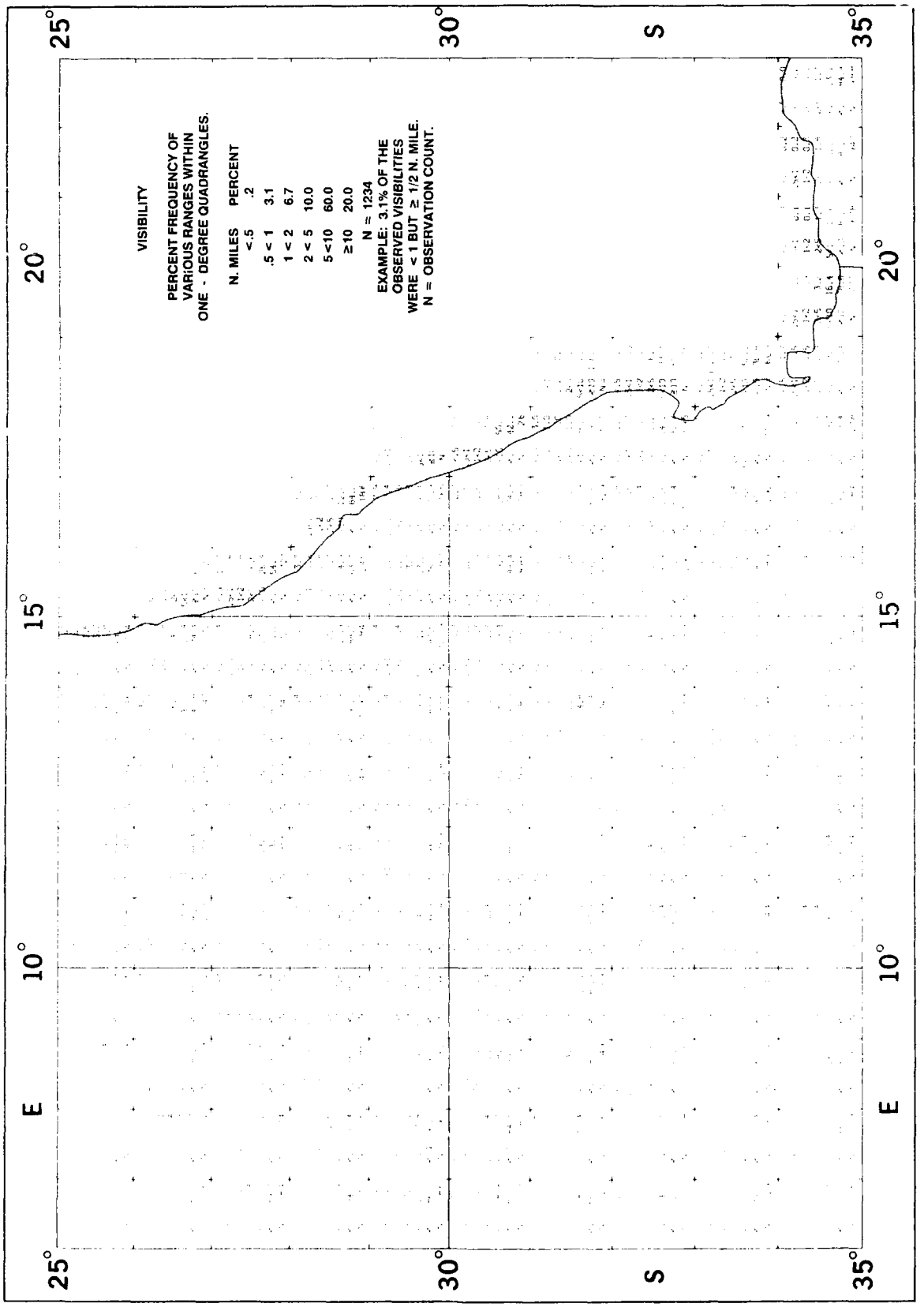
June

Precipitation

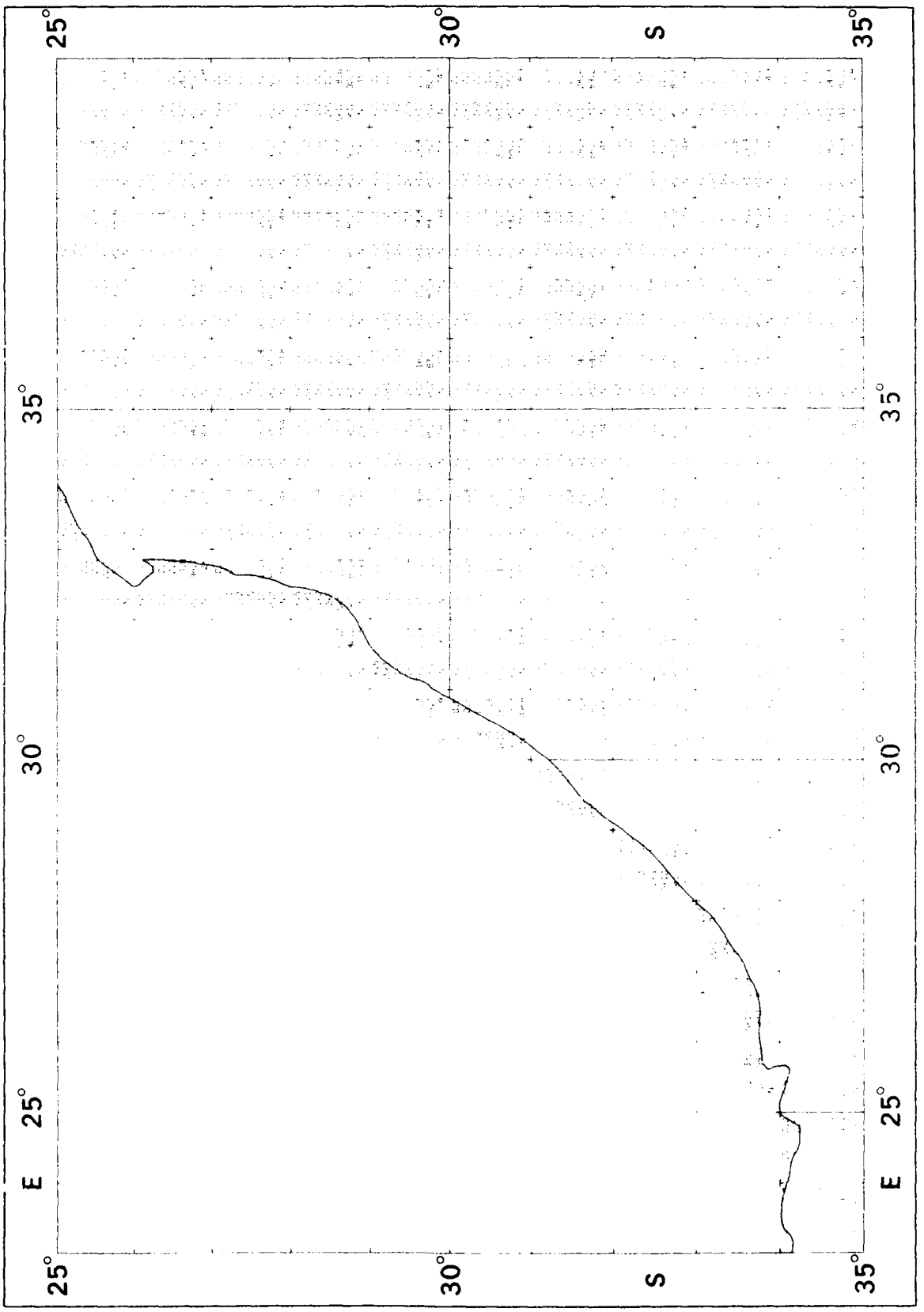


June

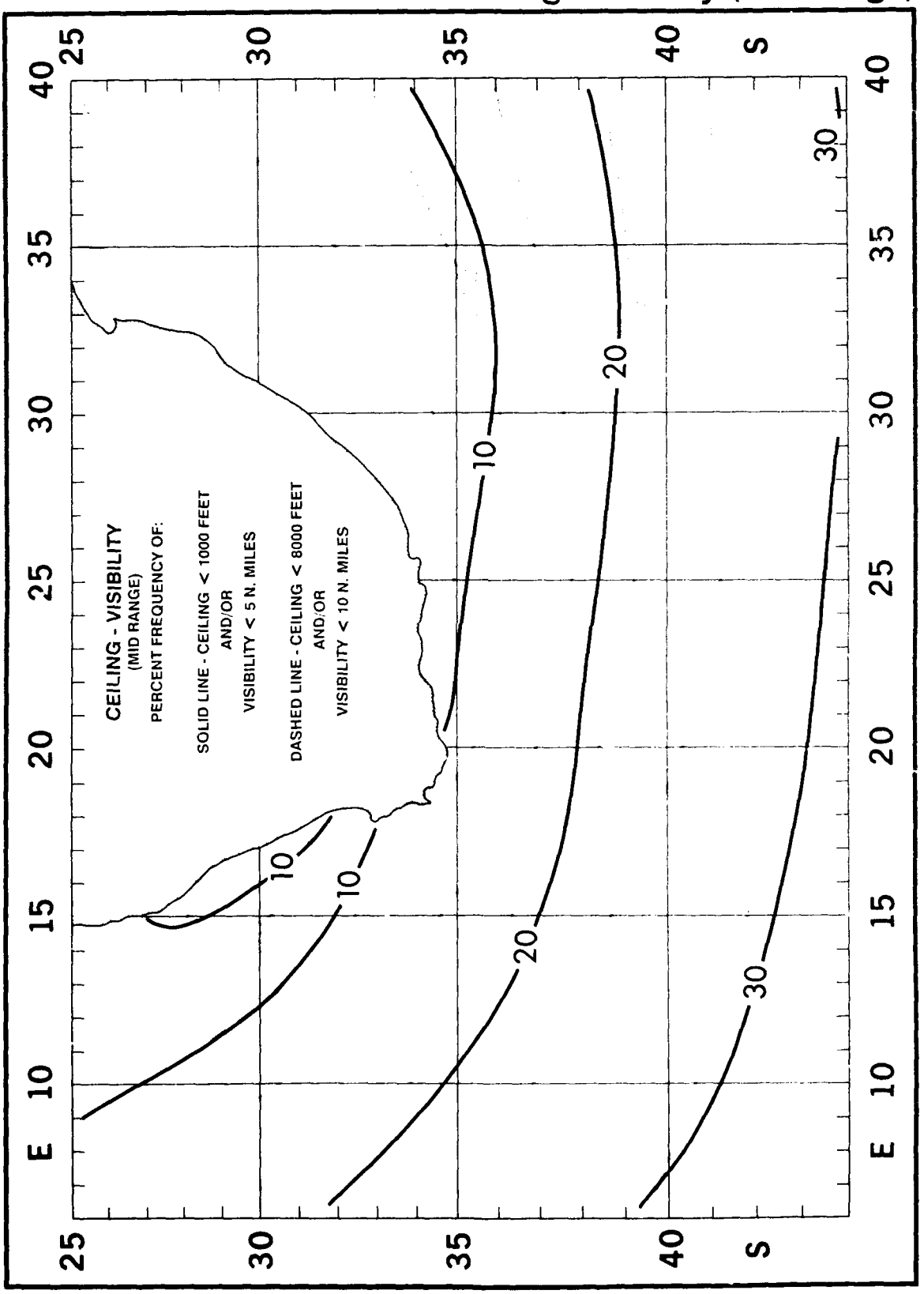
Visibility



June **Visibility**

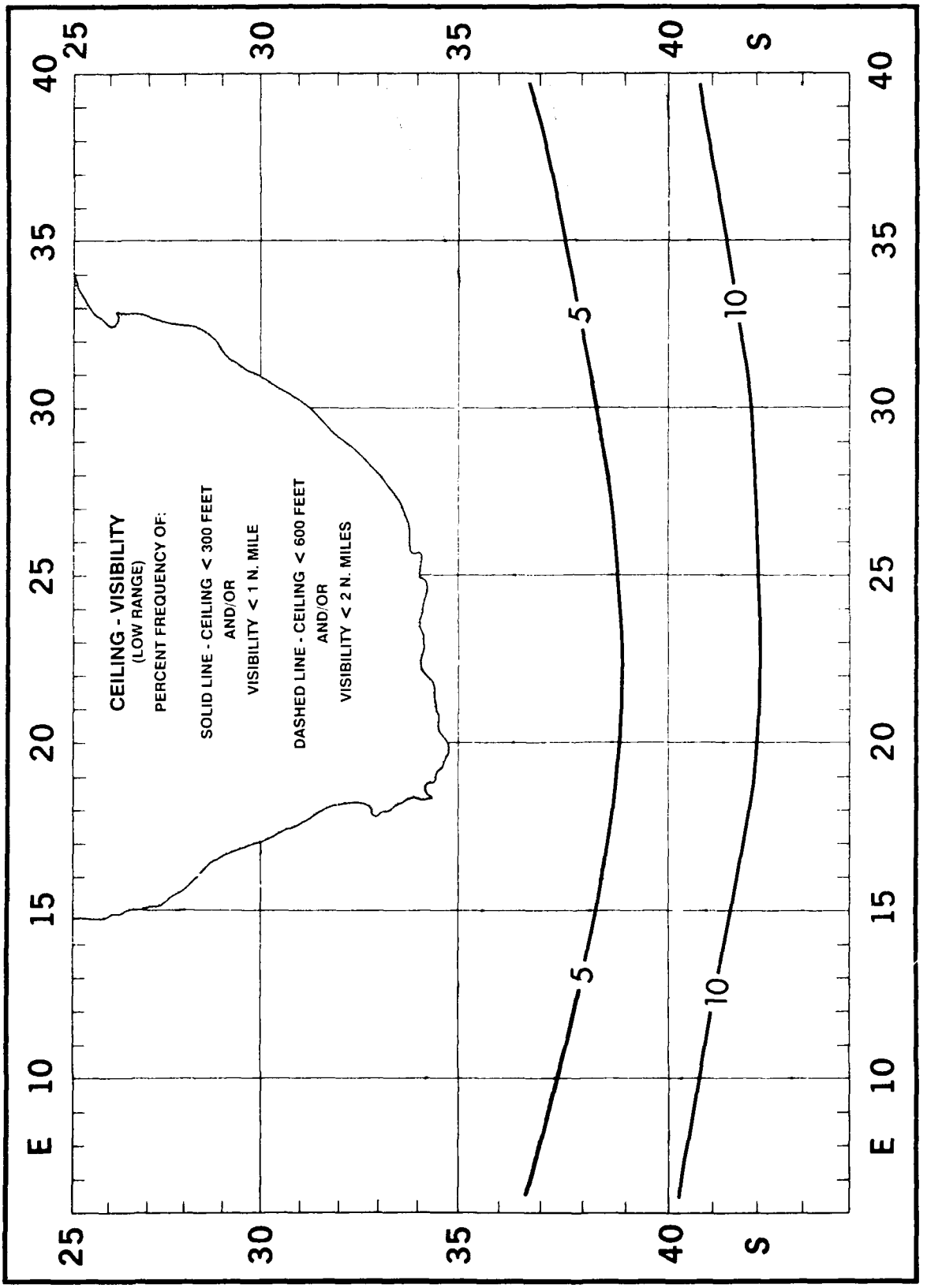


June **Ceiling - Visibility (Mid Range)**

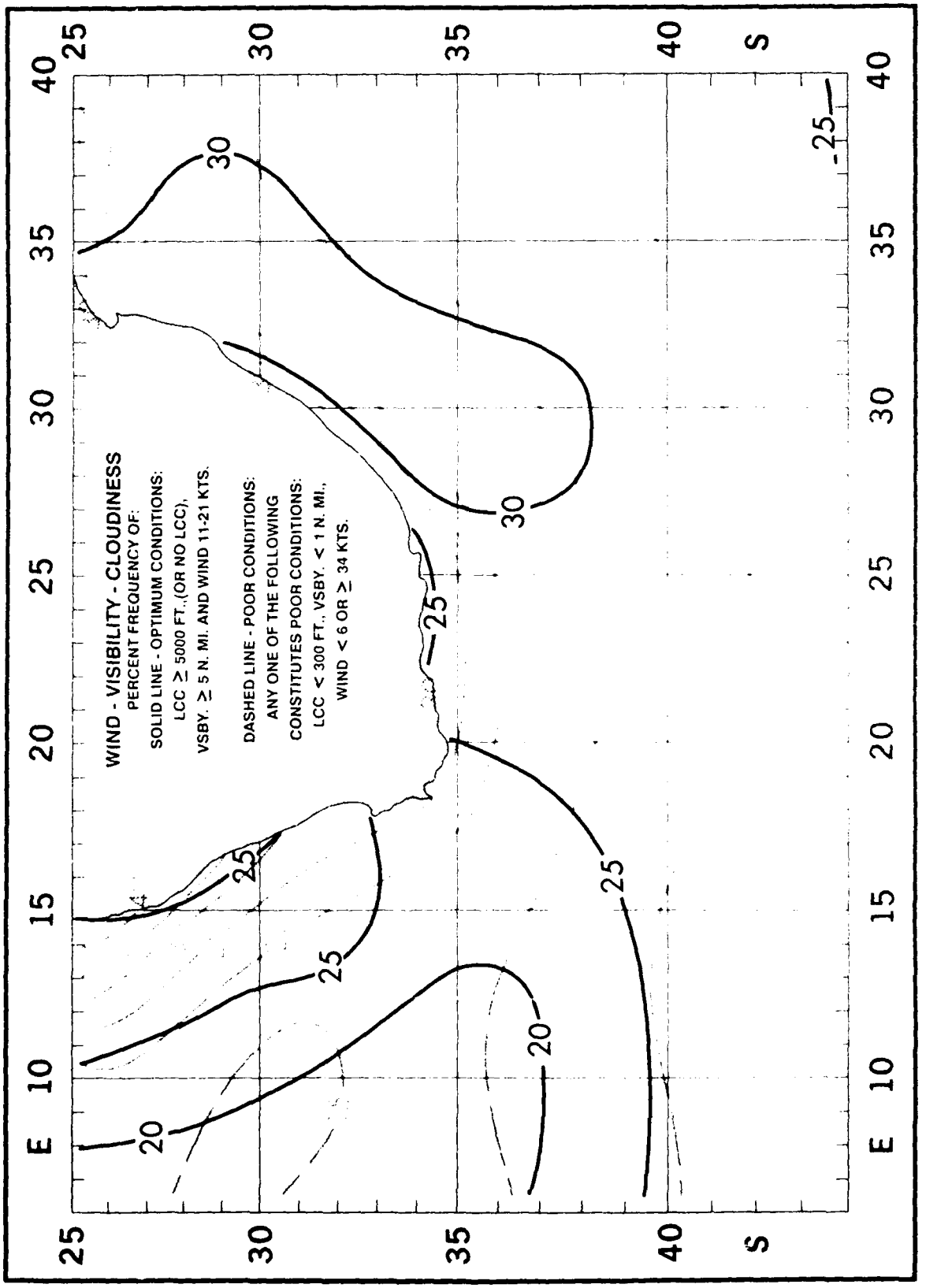


June

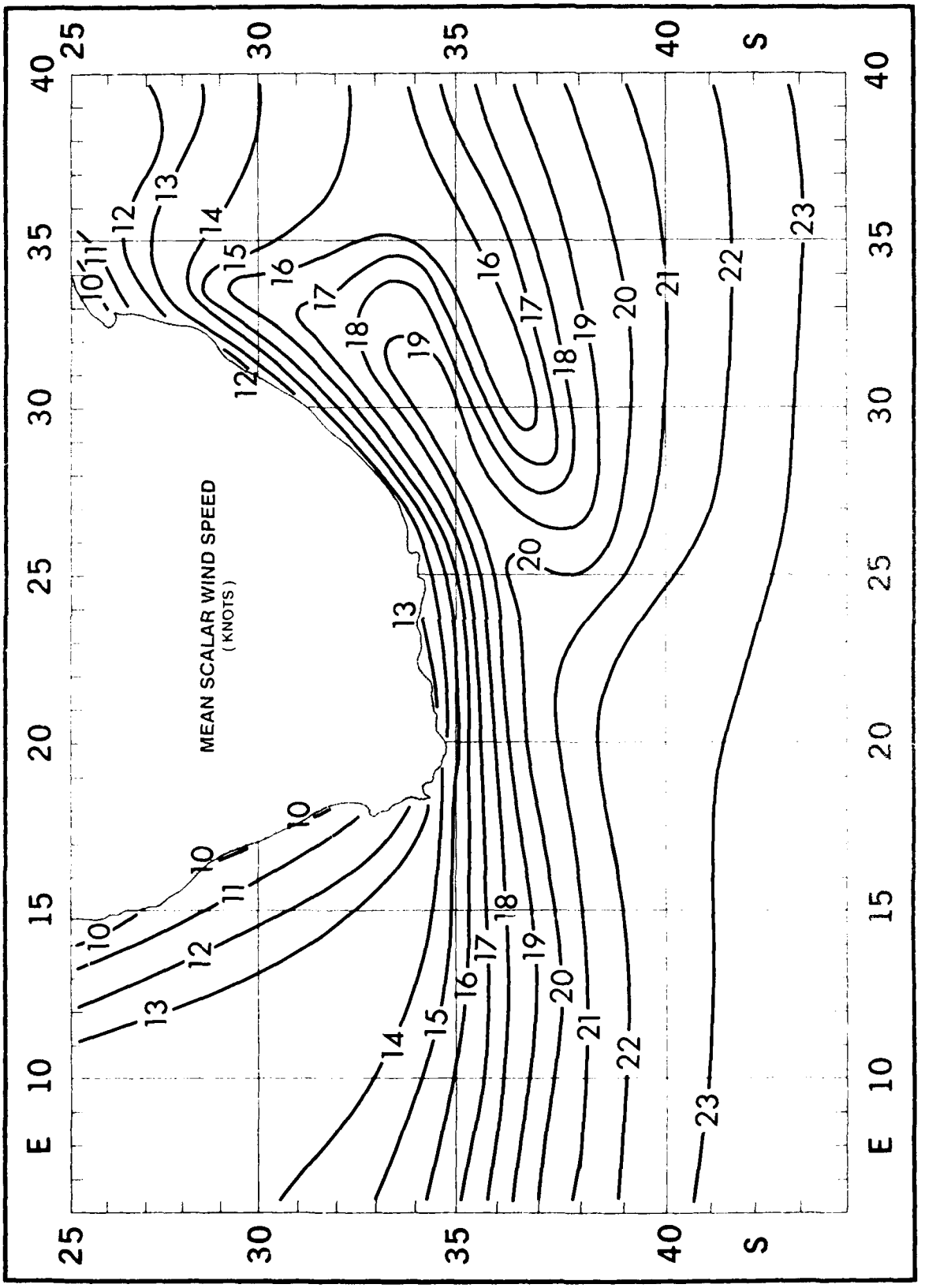
Ceiling - Visibility (Low Range)

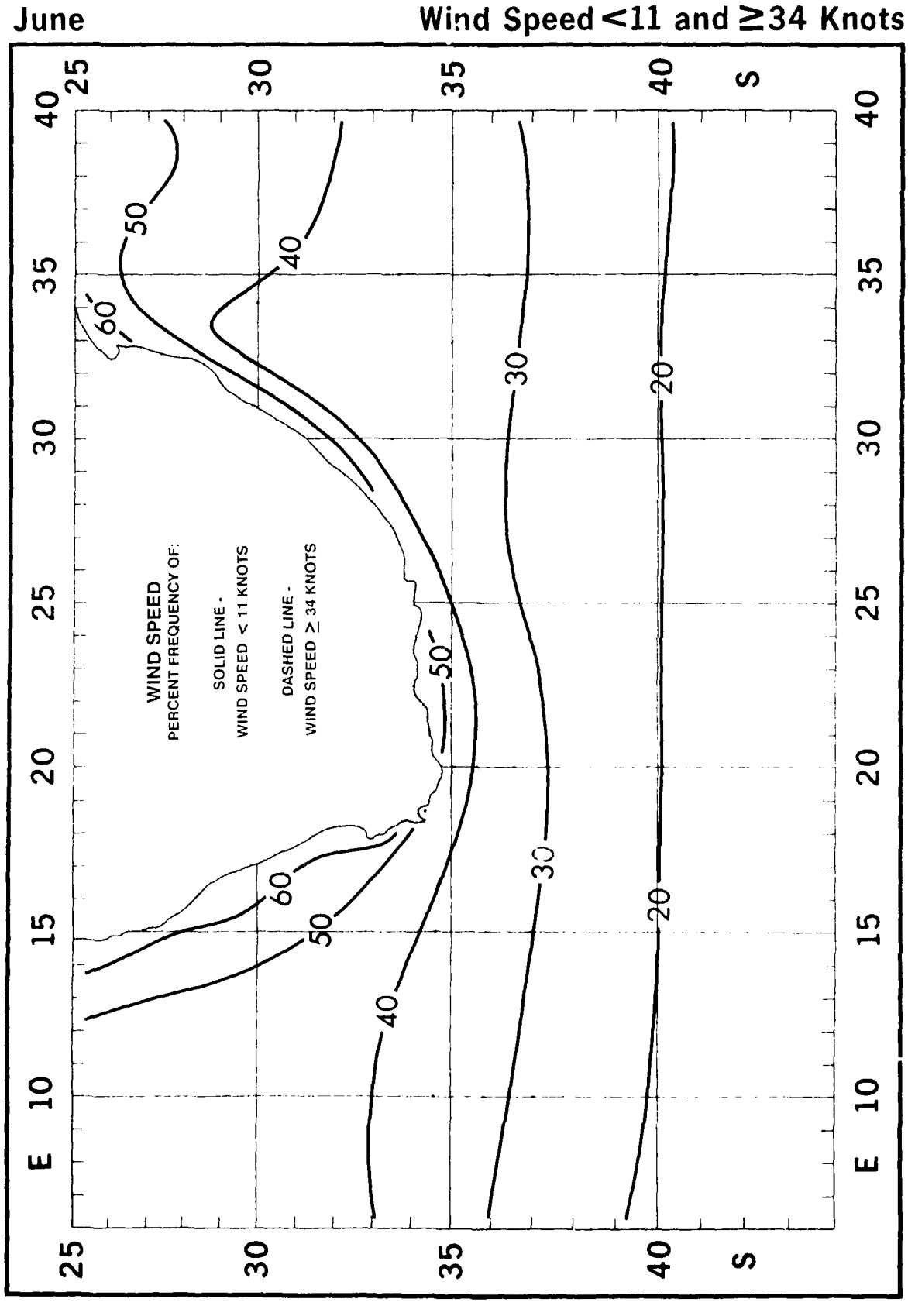


June **Wind · Visibility · Cloudiness**



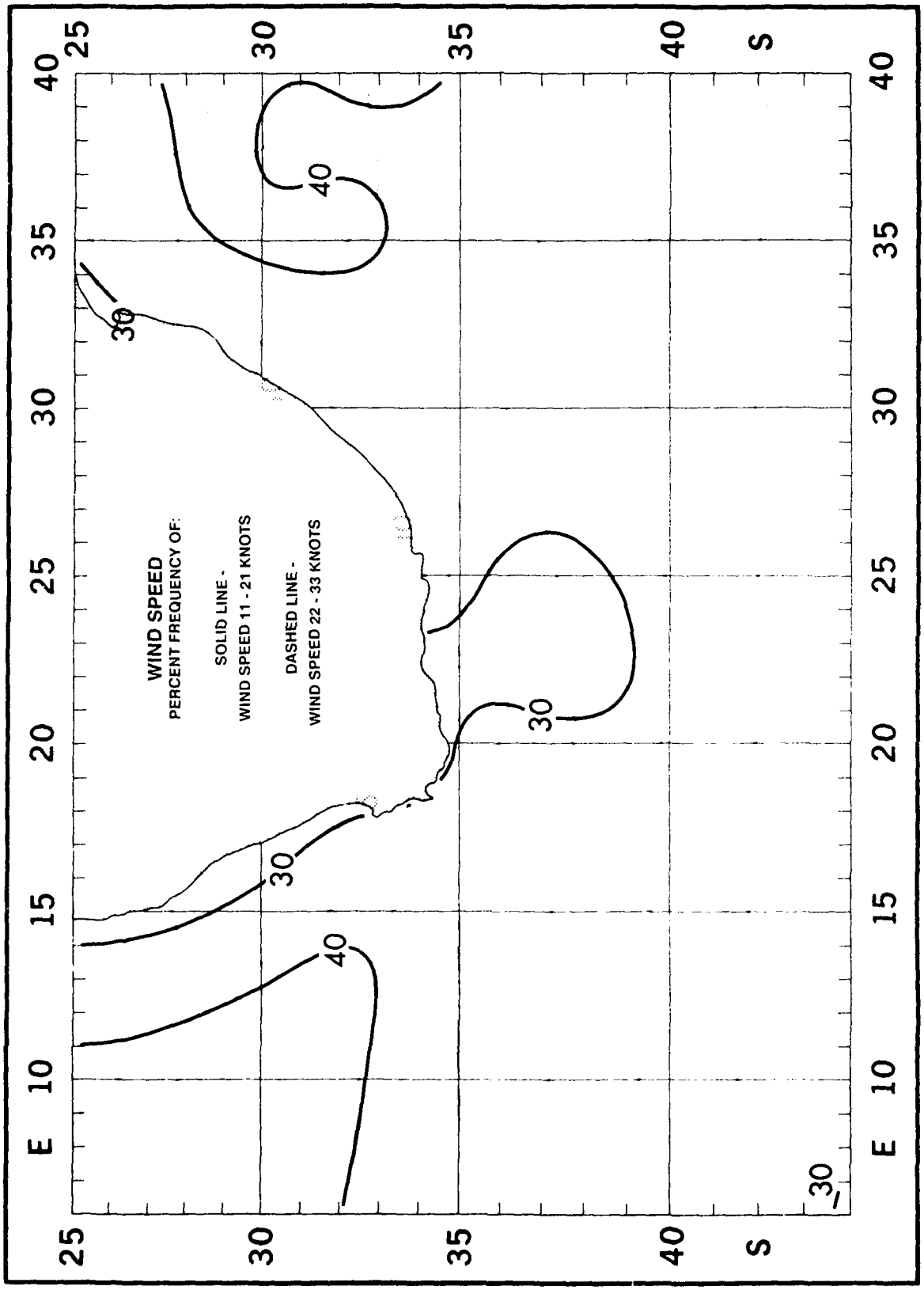
June **Mean Scalar Wind Speed**




June
Wind Speed ≤11 and ≥34 Knots
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED < 11 KNOTS
DASHED LINE -
WIND SPEED ≥ 34 KNOTS
60
50
40
30
20
25
30
35
40
S
E
10
15
20
25
30
35
40

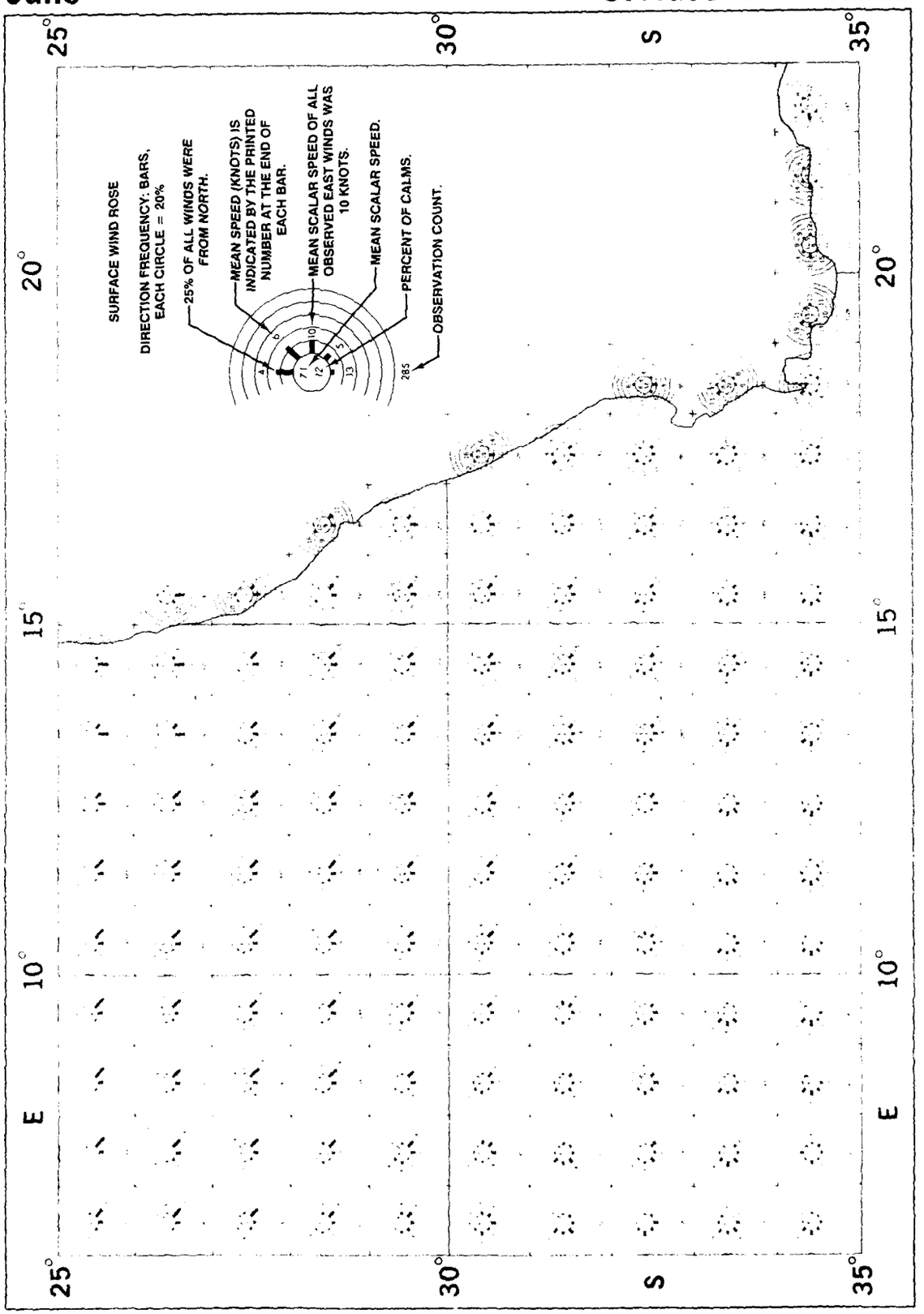
June

Wind Speed 11 - 21 and 22 - 33 Knots



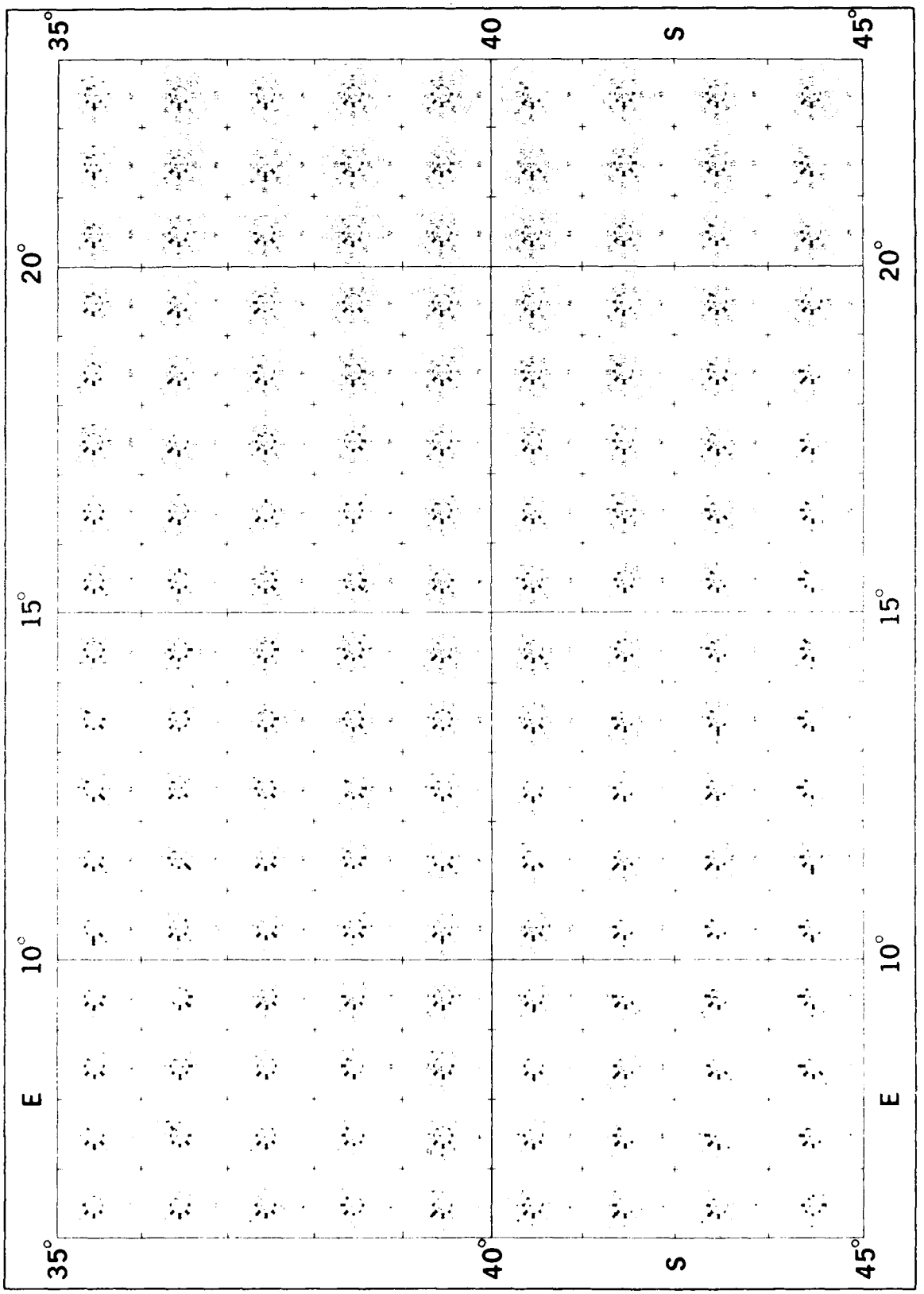
June

Surface Wind Roses



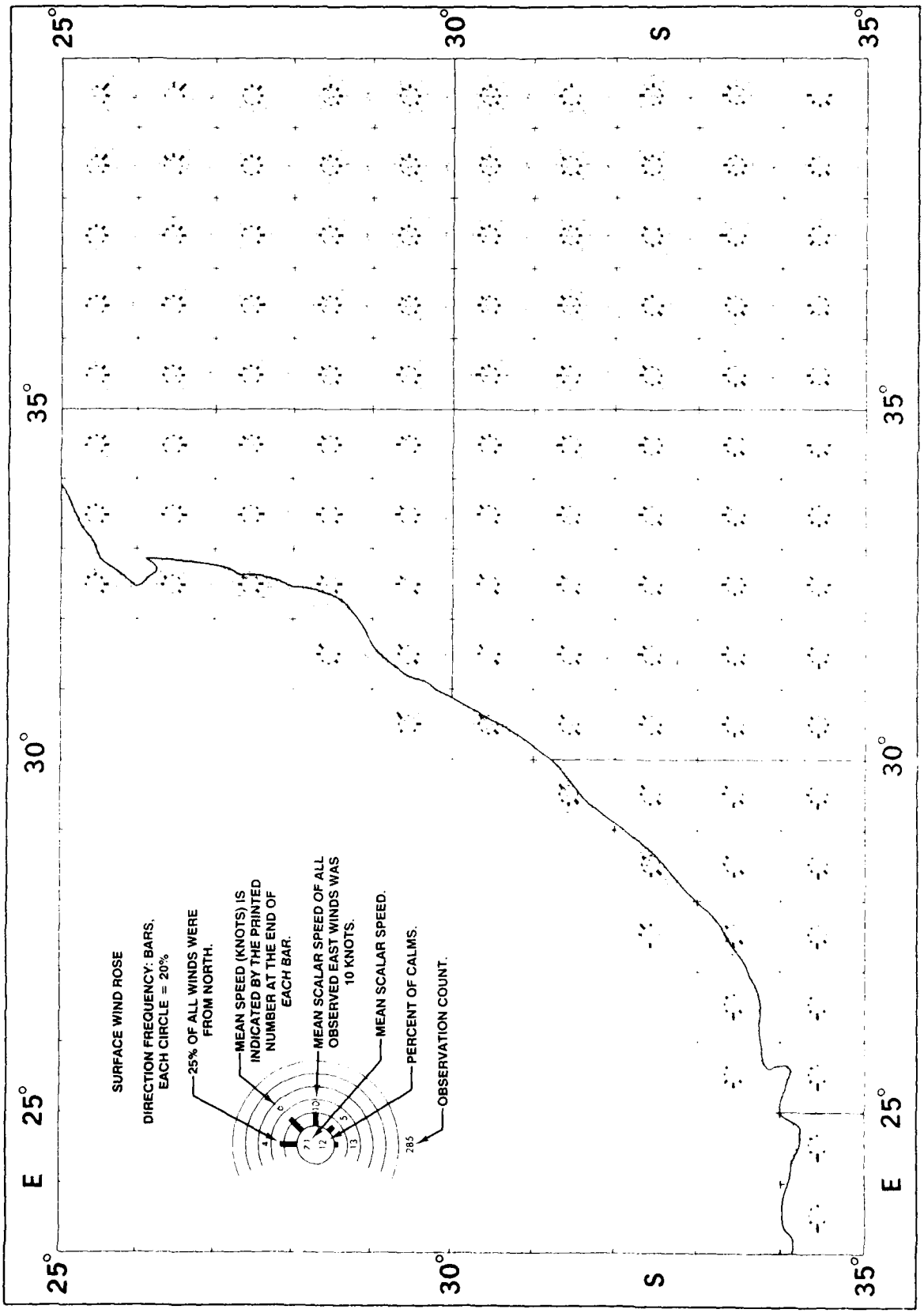
June

Surface Wind Roses



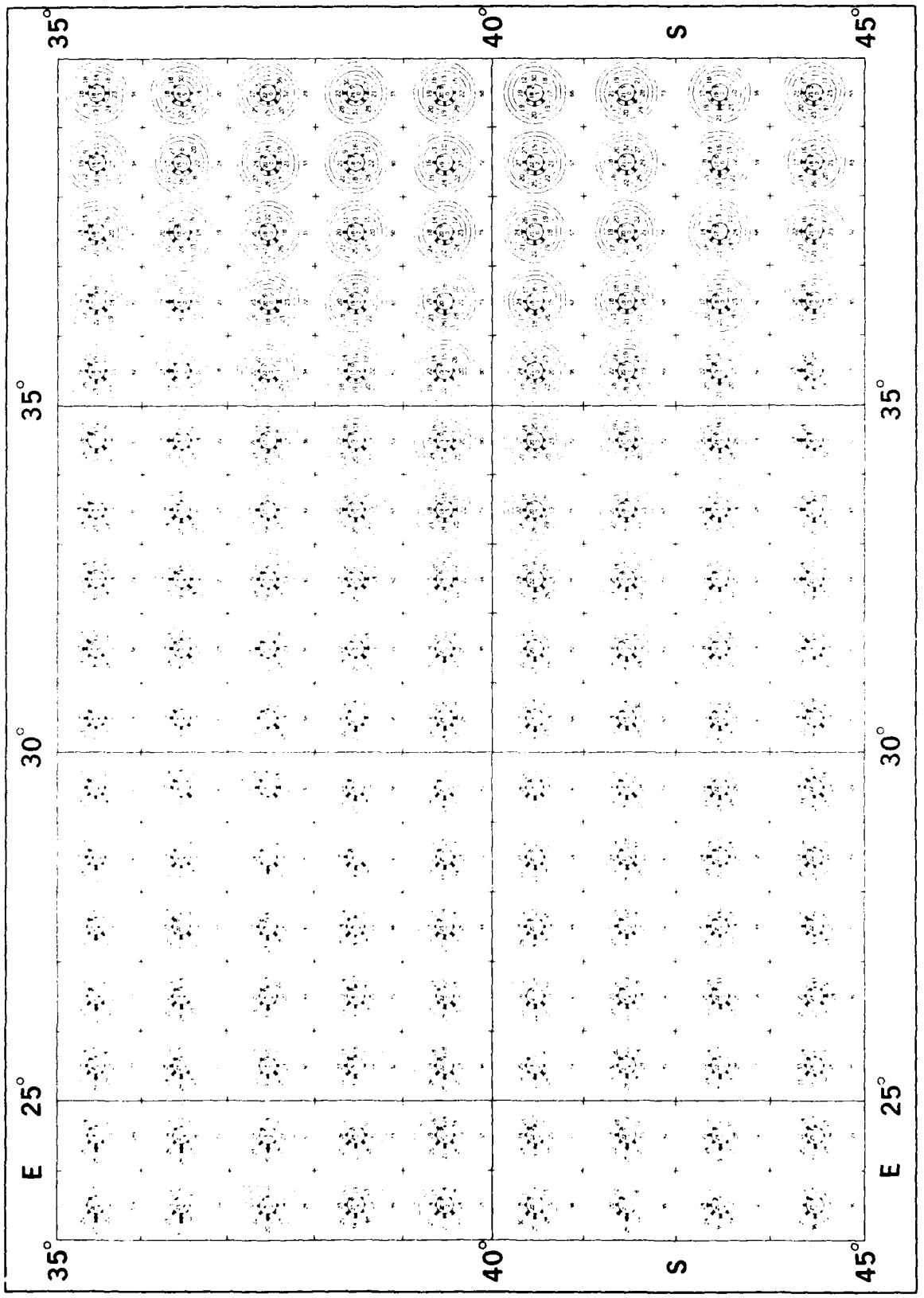
June

Surface Wind Roses



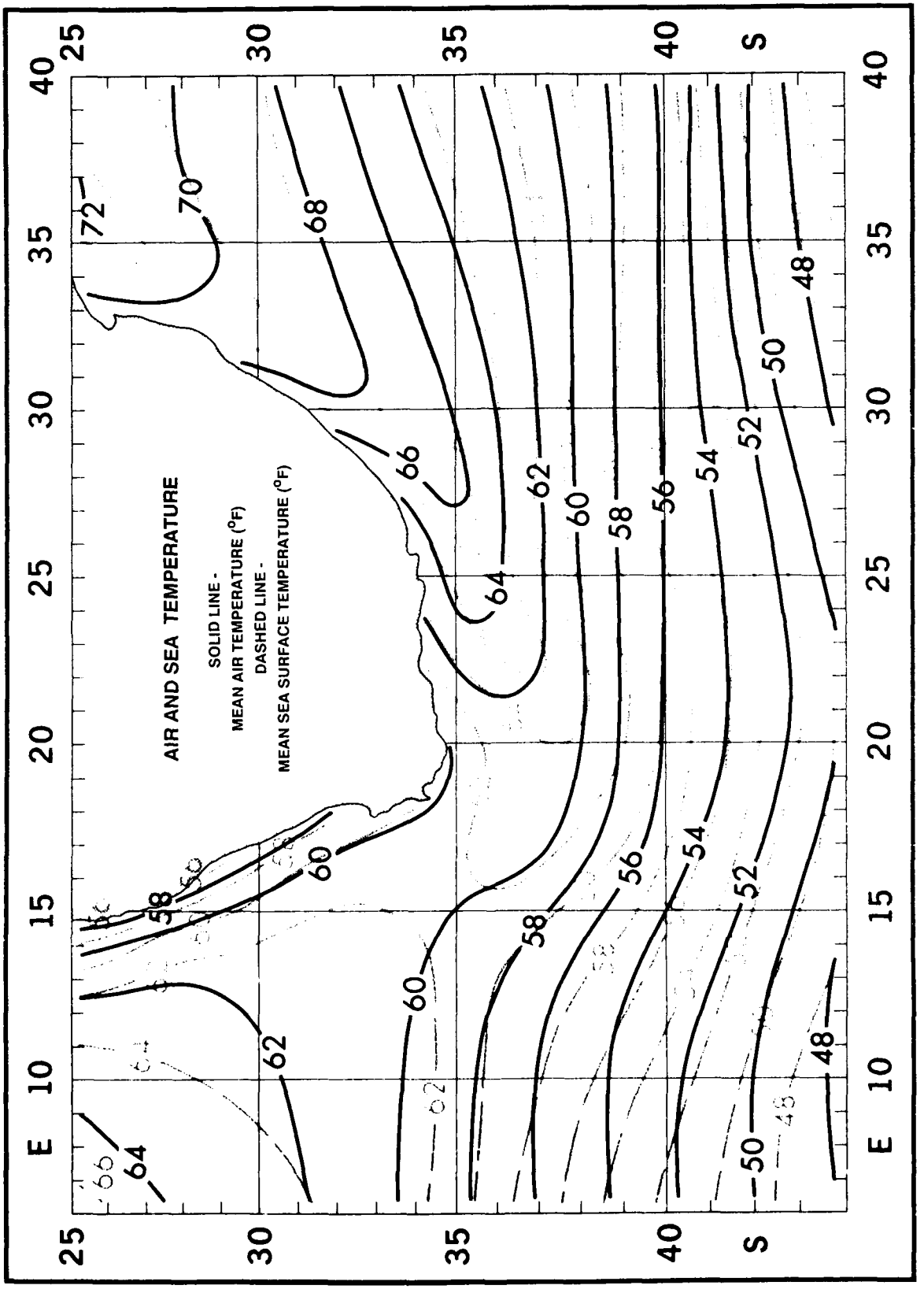
June

Surface Wind Roses



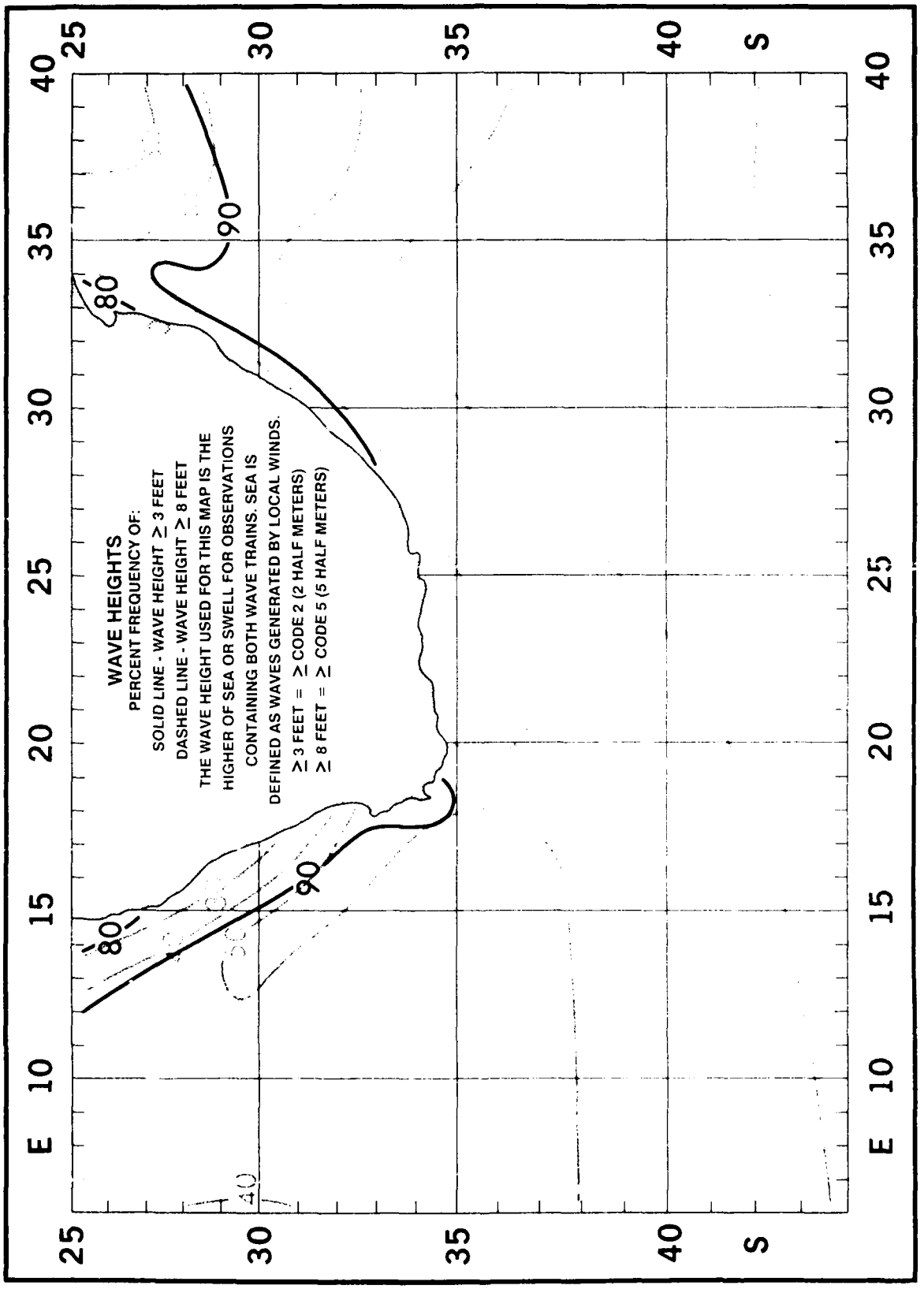
June

Air and Sea Temperature



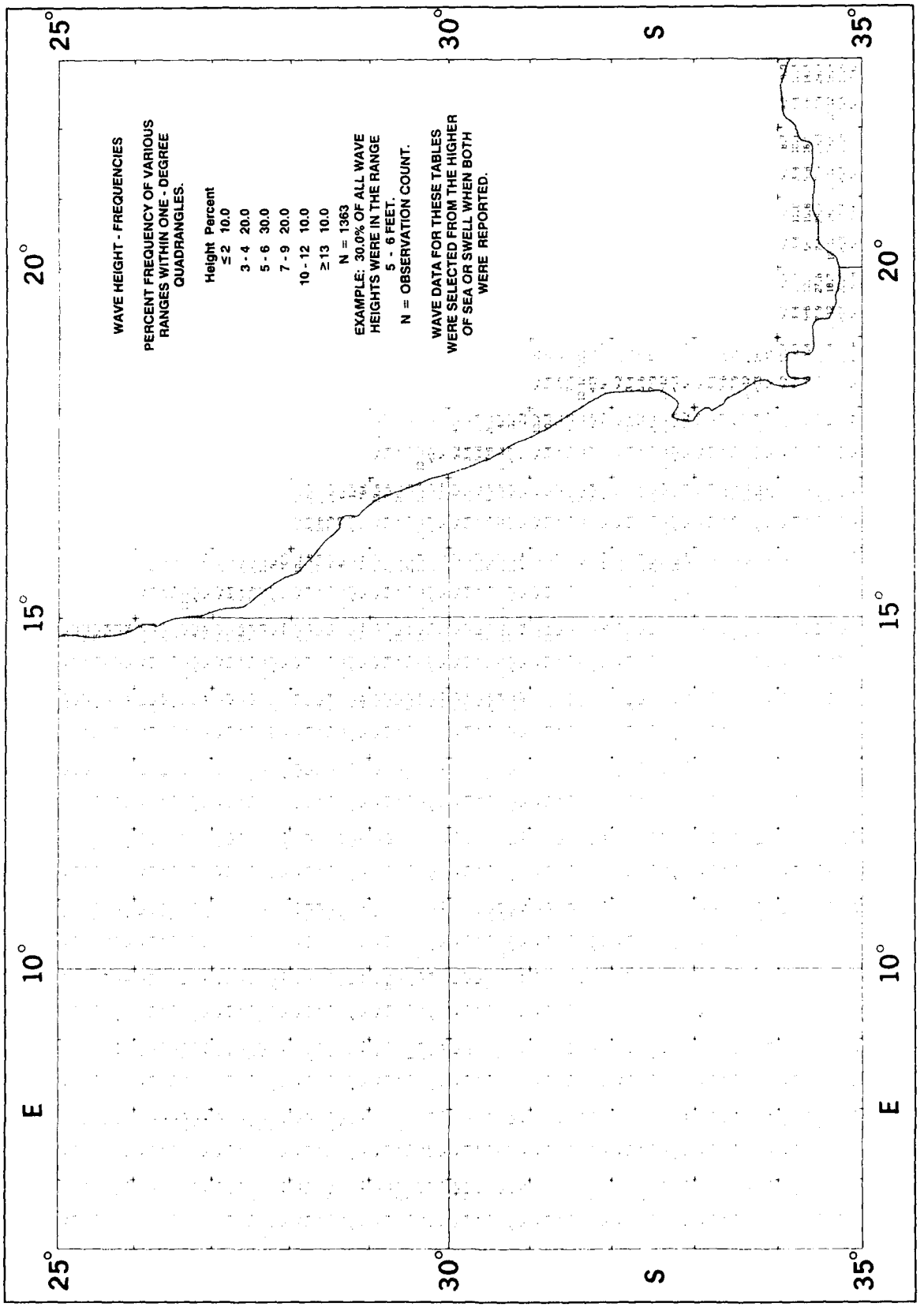
June

Wave Height

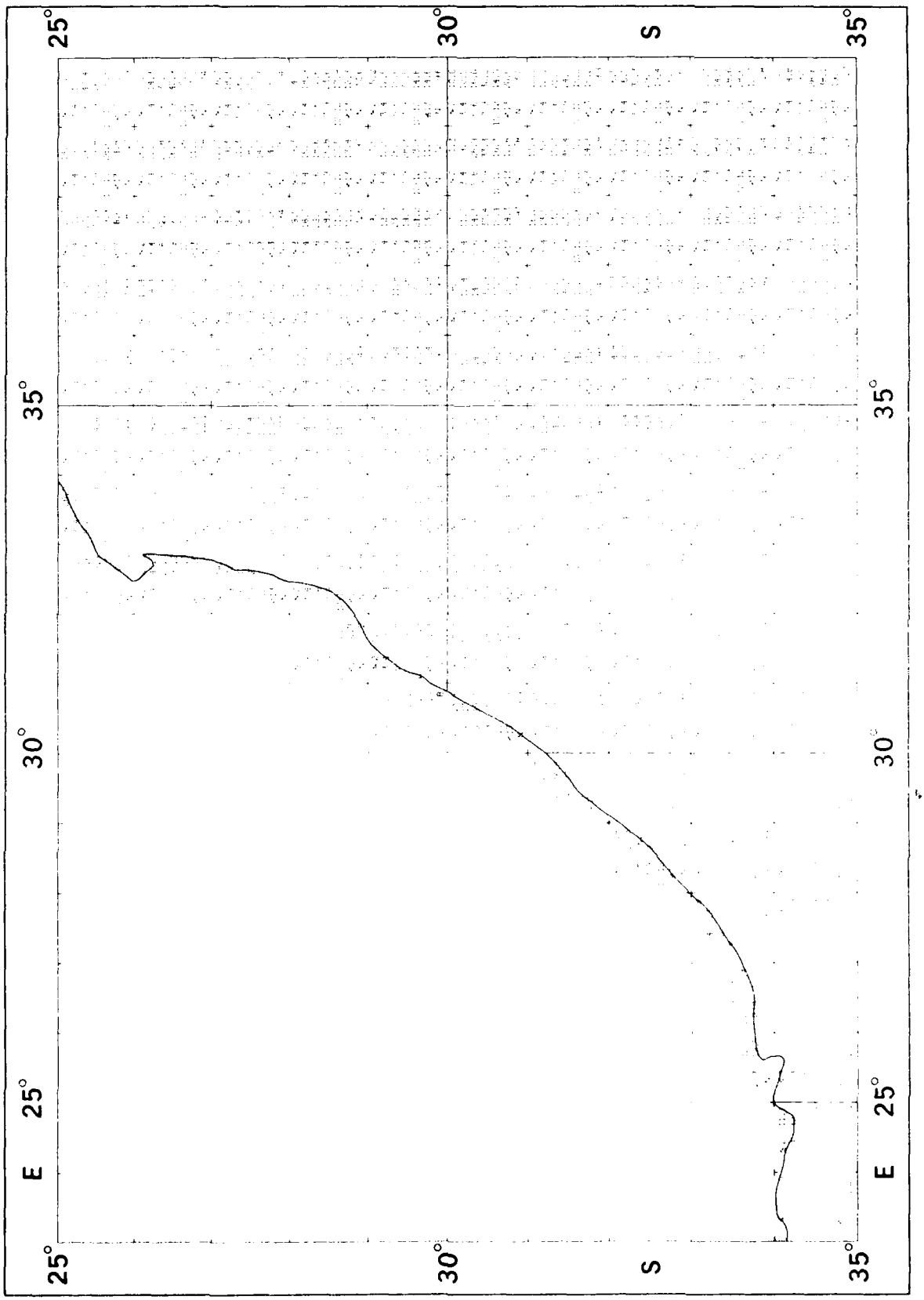


June

Wave Height

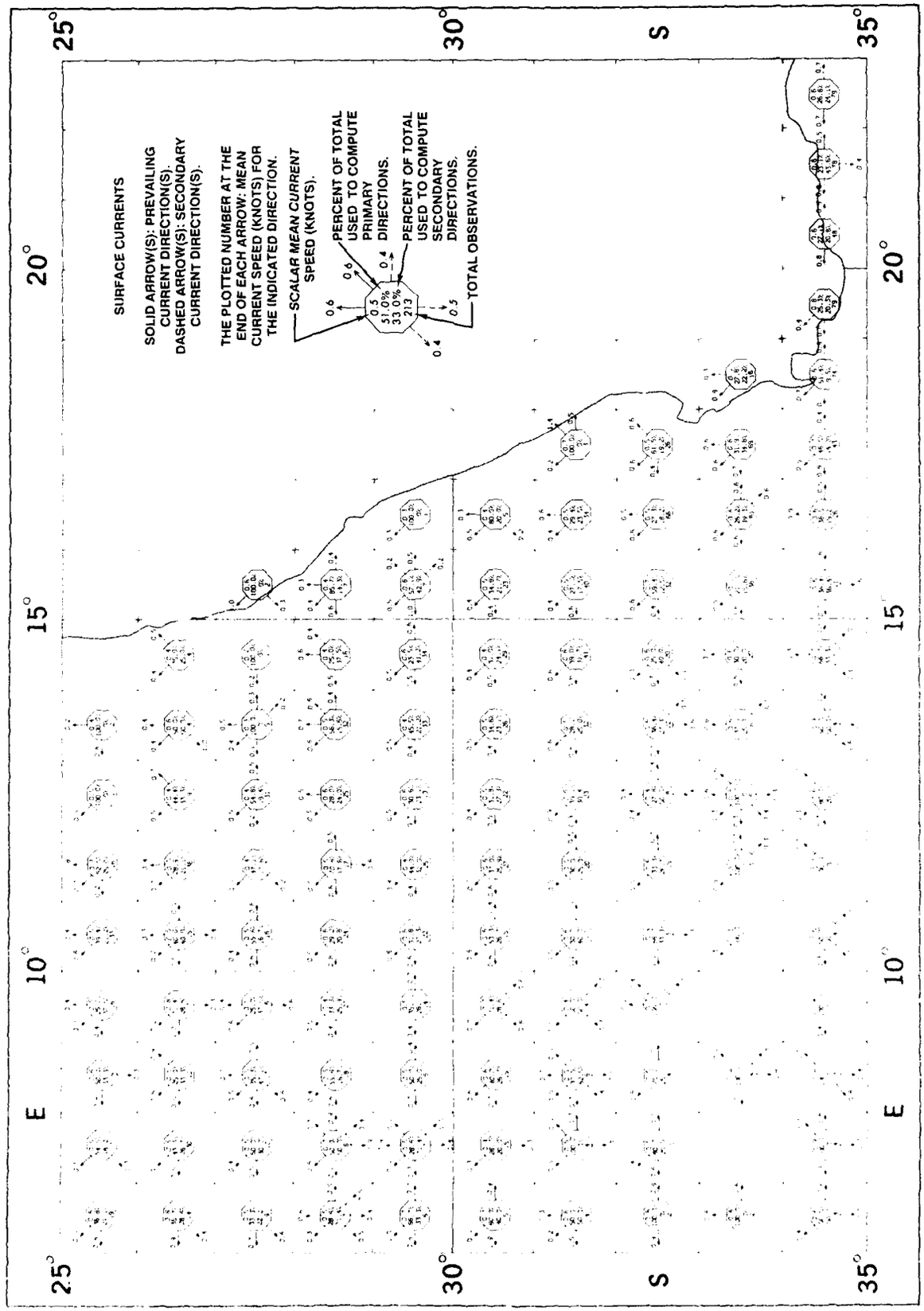


June **Wave Height**

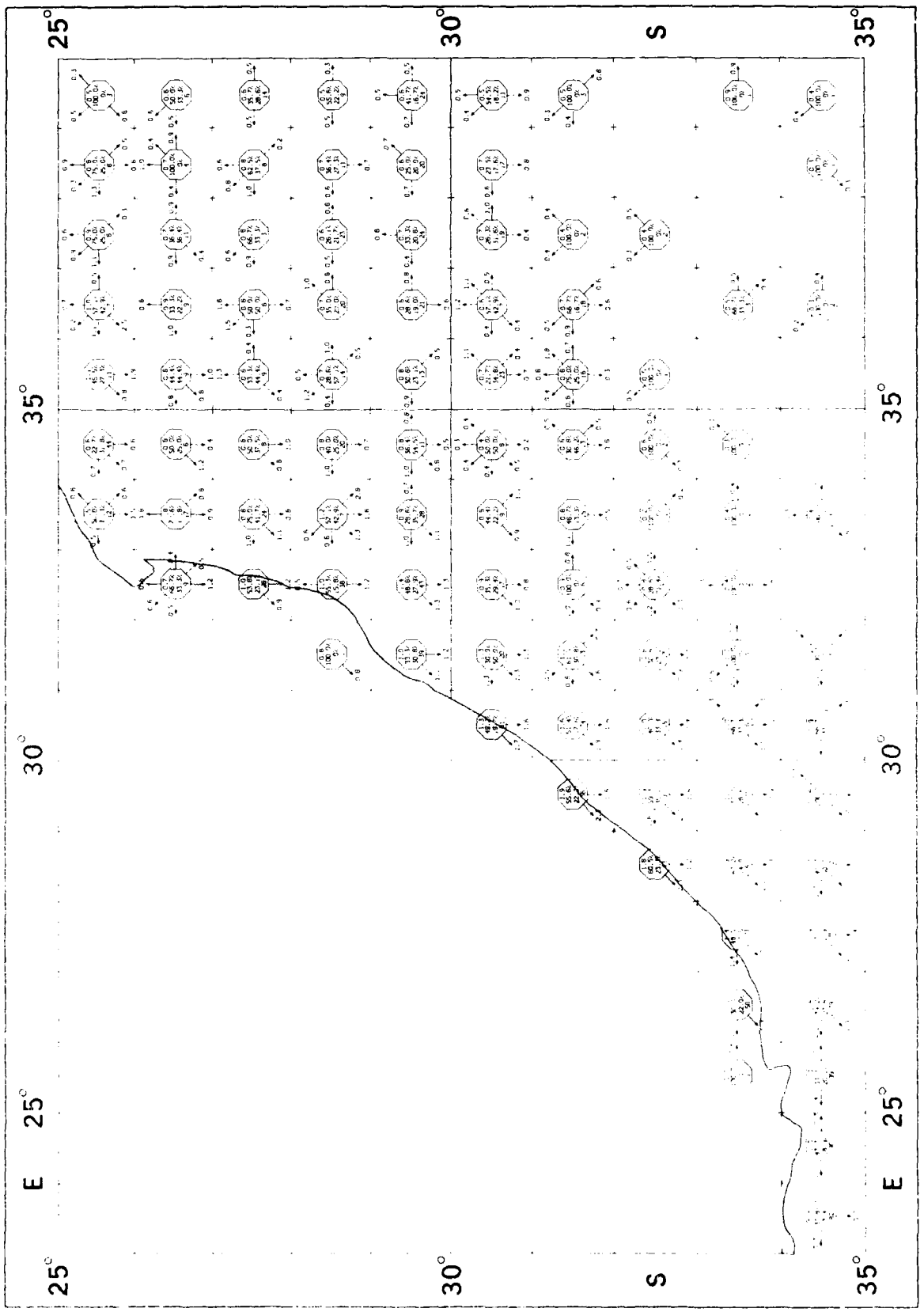


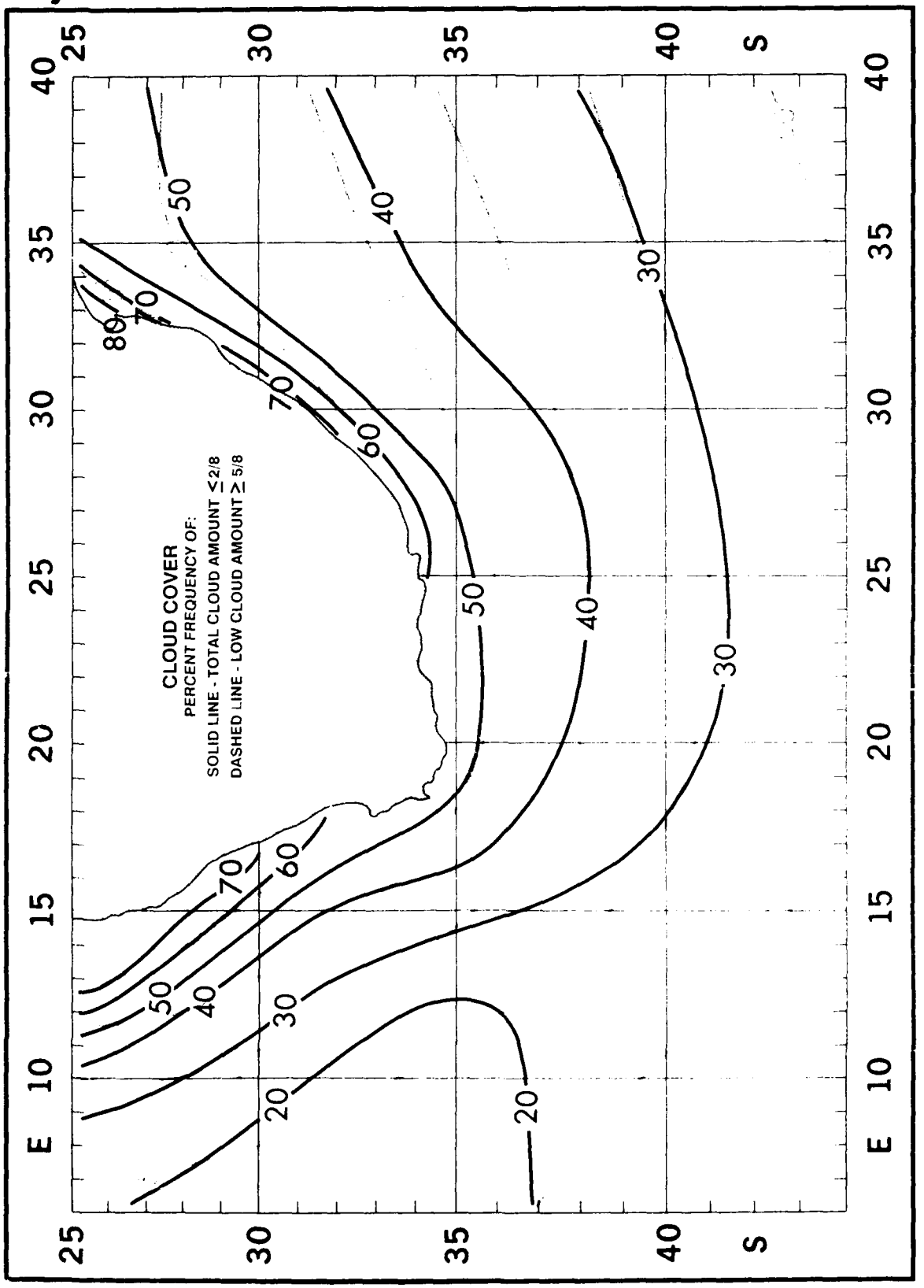
June

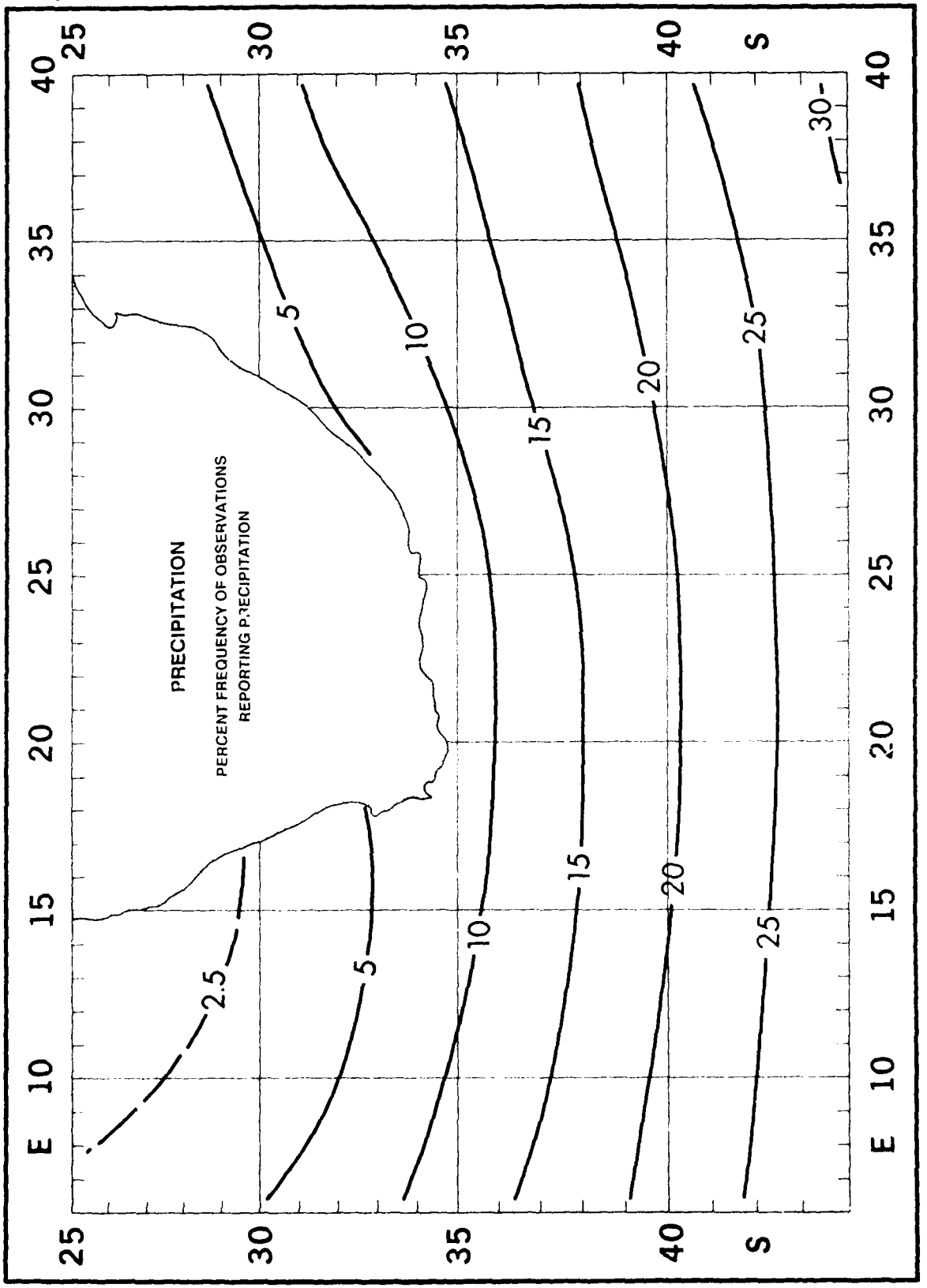
Surface Currents



June **Surface Currents**

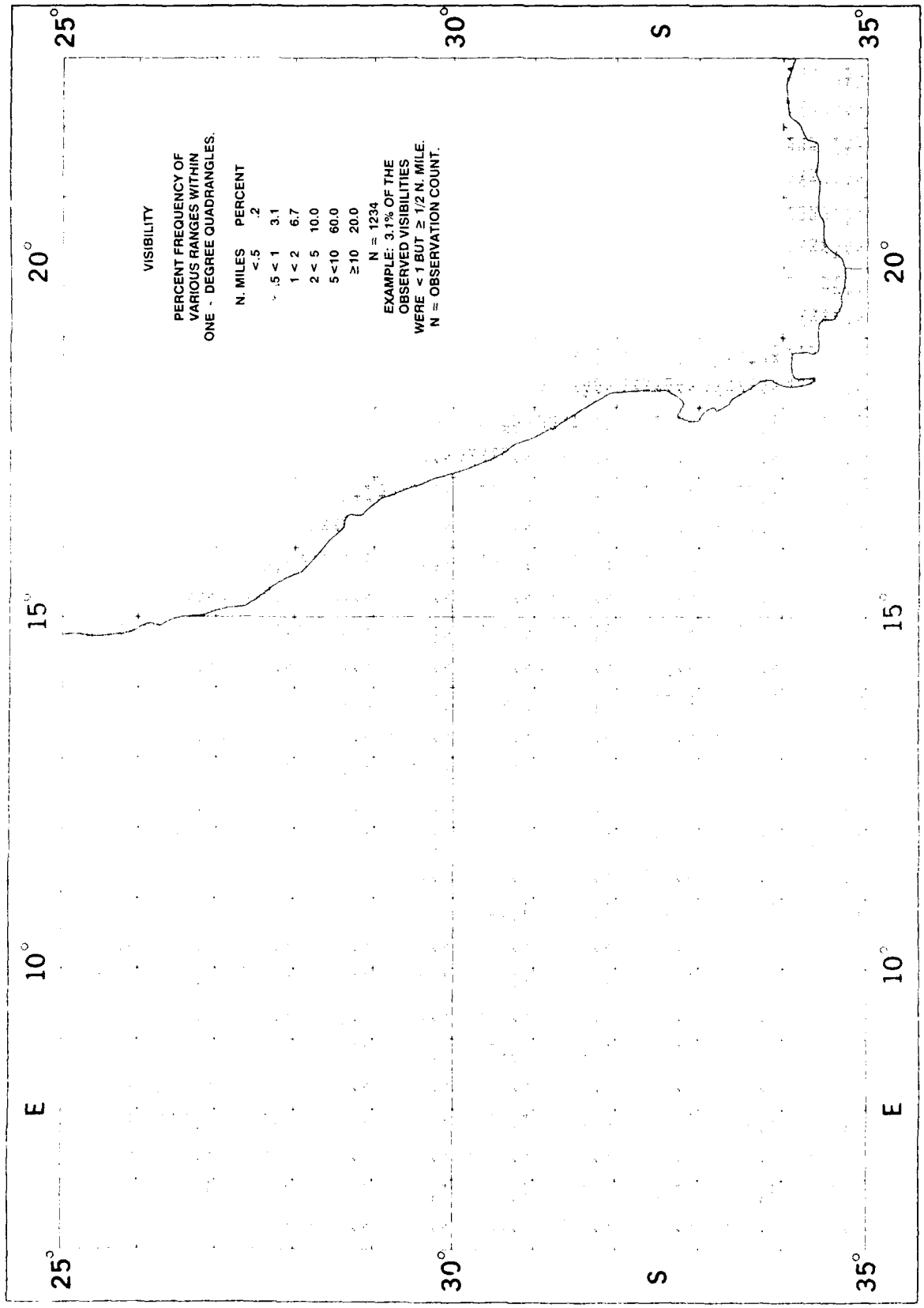



CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE - TOTAL CLOUD AMOUNT ≤ 2/8
DASHED LINE - LOW CLOUD AMOUNT ≥ 5/8
80
70
60
50
40
30
20
E
S
25
30
35
40
10
15
20

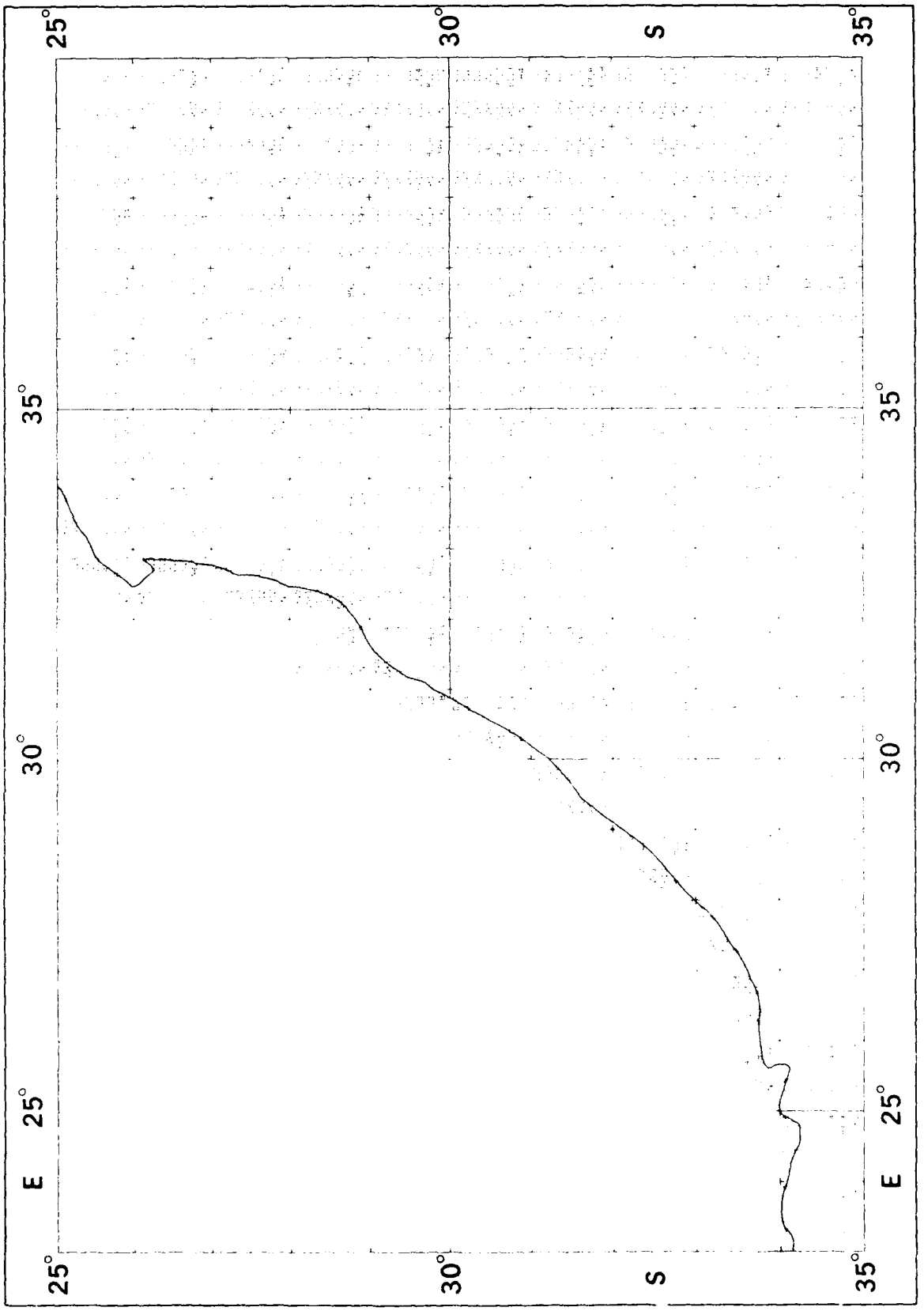

PRECIPITATION
PERCENT FREQUENCY OF OBSERVATIONS REPORTING PRECIPITATION
2.5
5
10
15
20
25
30
E 10
15
20
25
30
35
40
S

July

Visibility

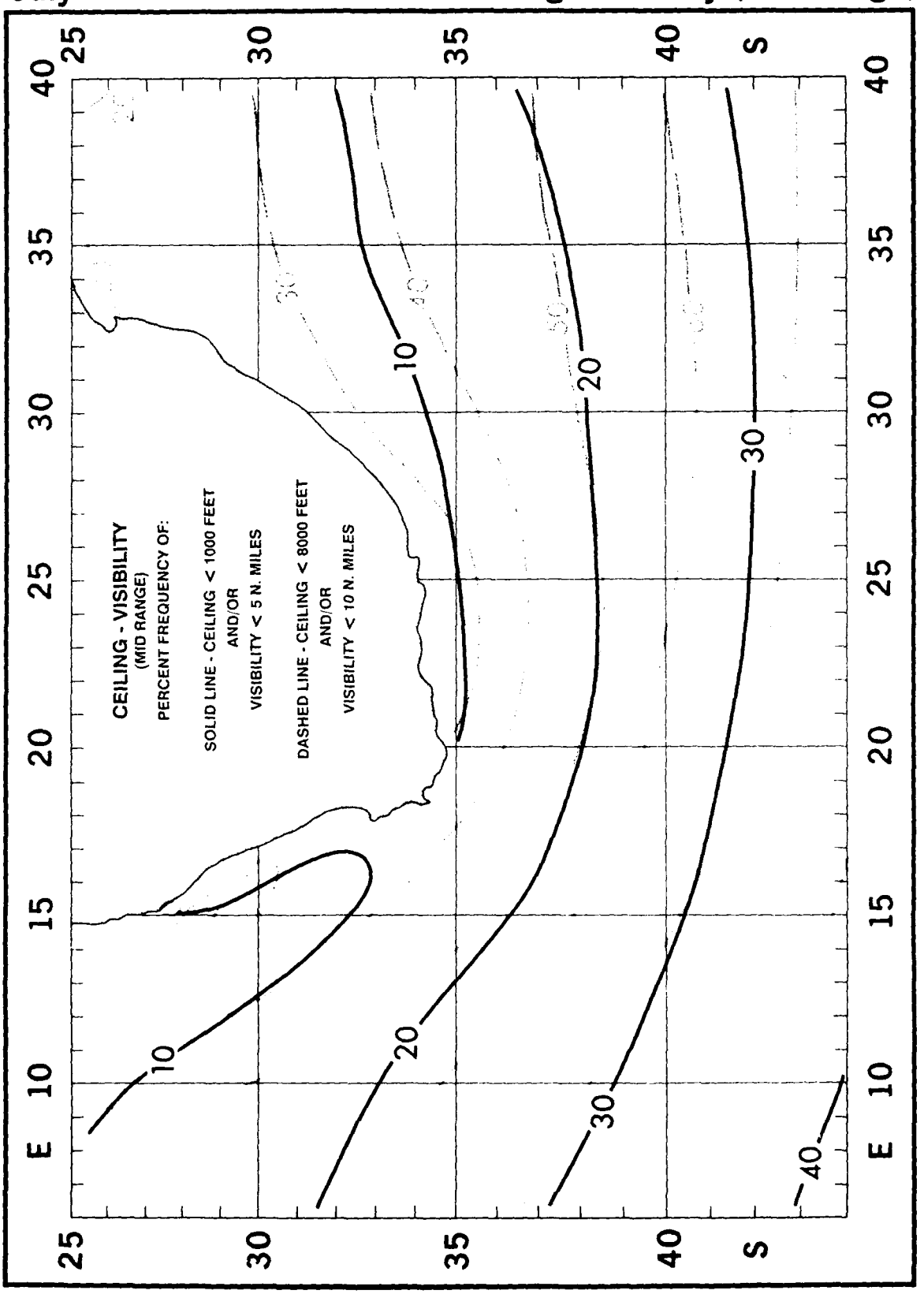


July **Visibility**



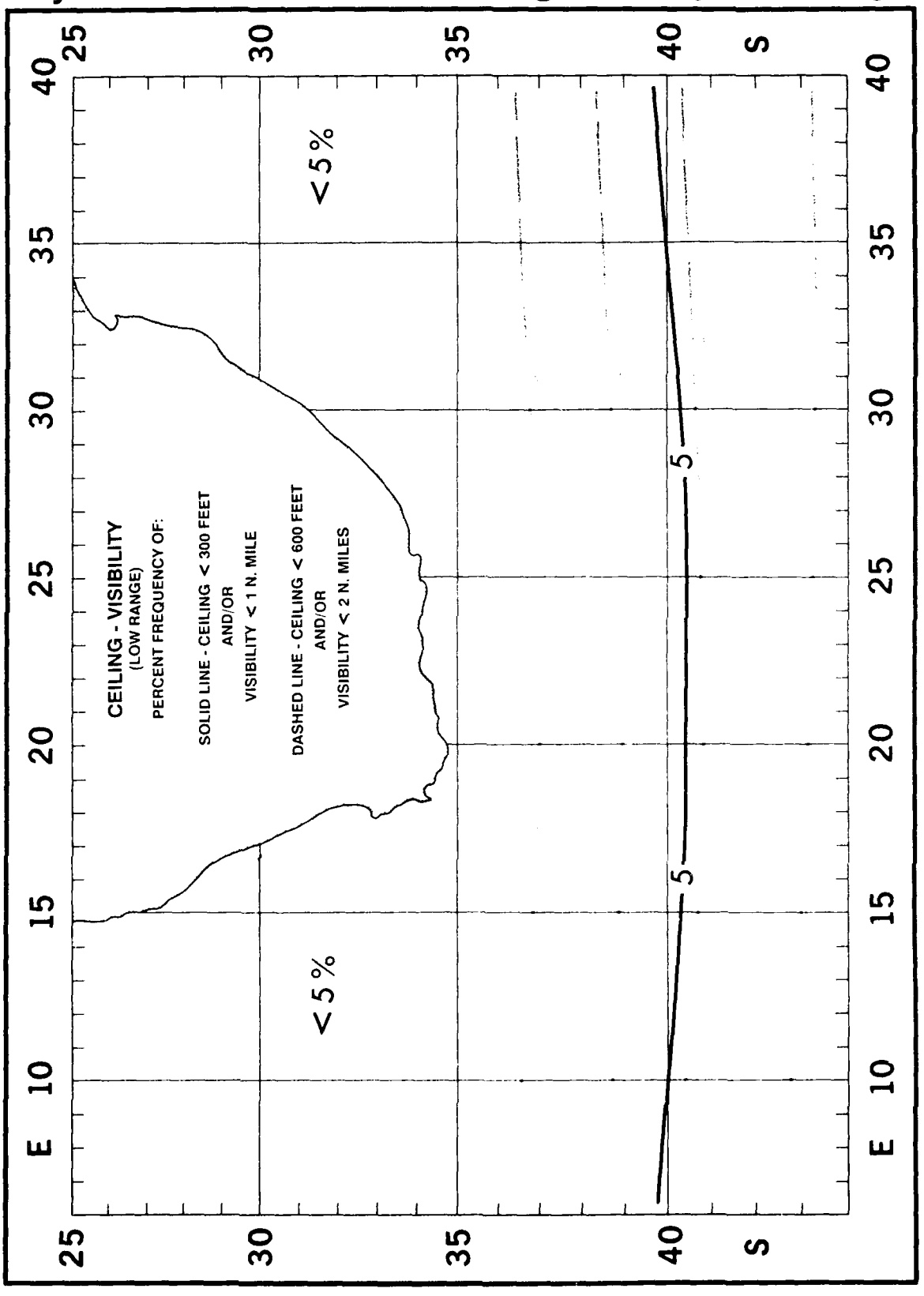
July

Ceiling - Visibility (Mid Range)



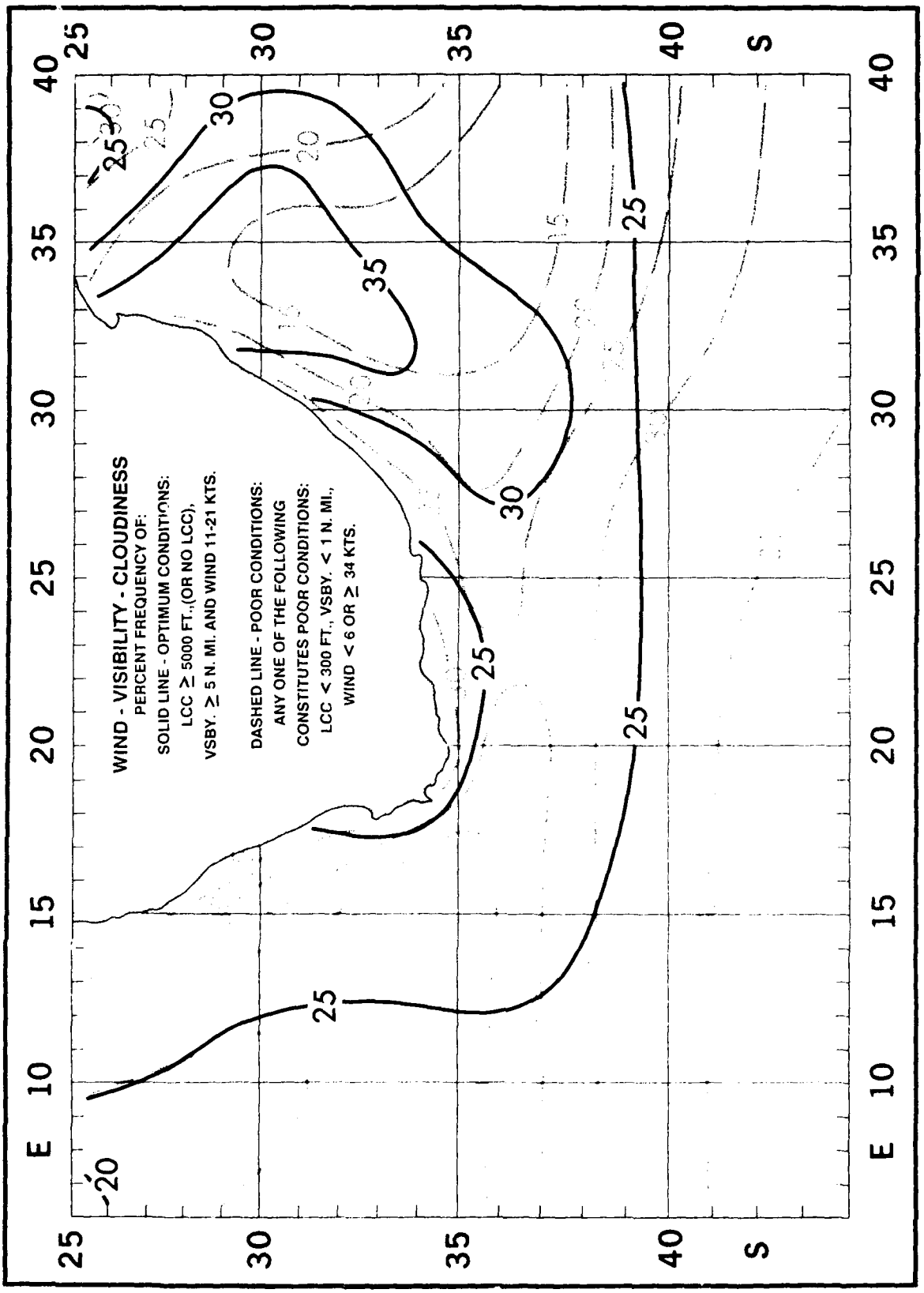
July

Ceiling - Visibility (Low Range)



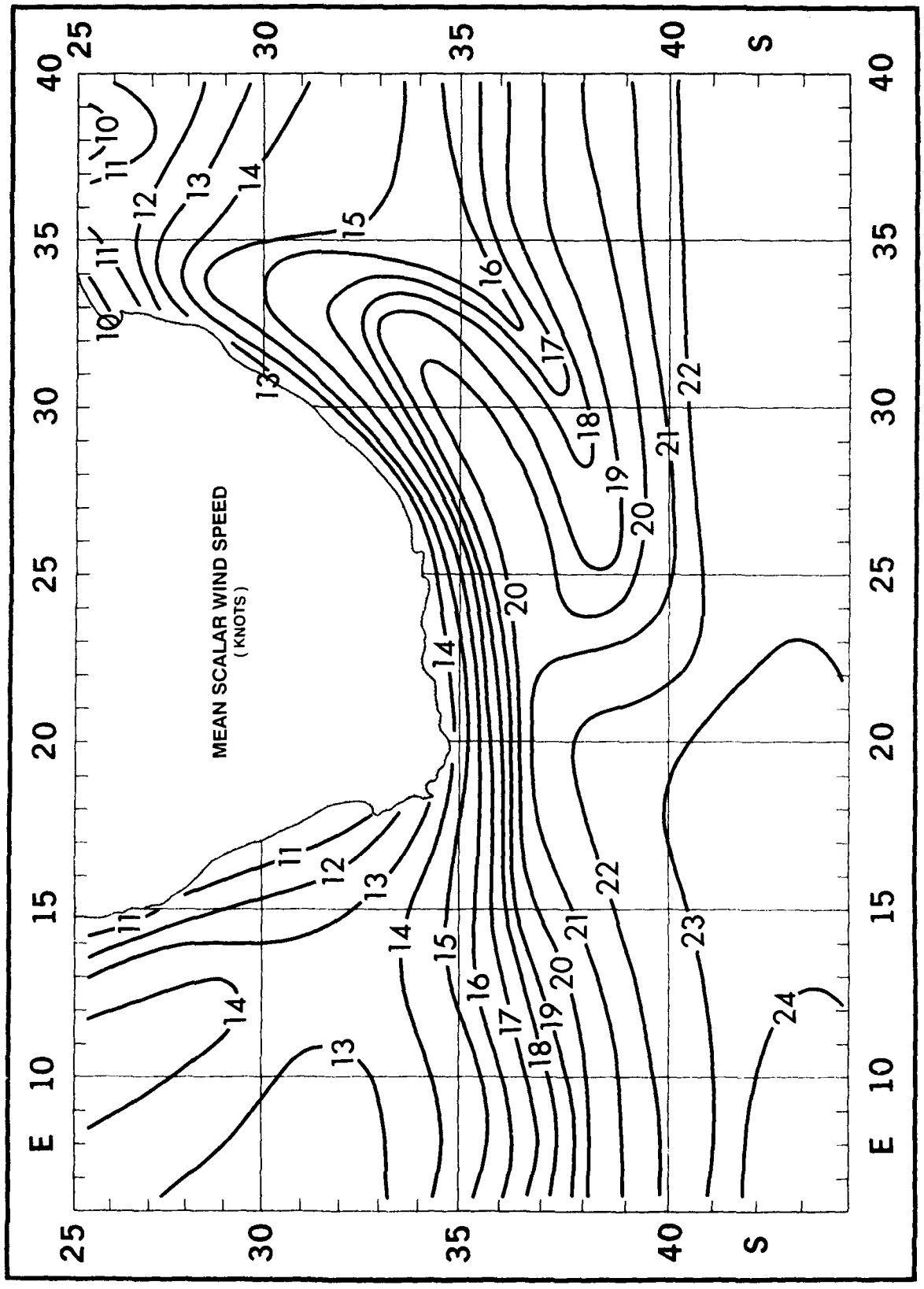
July

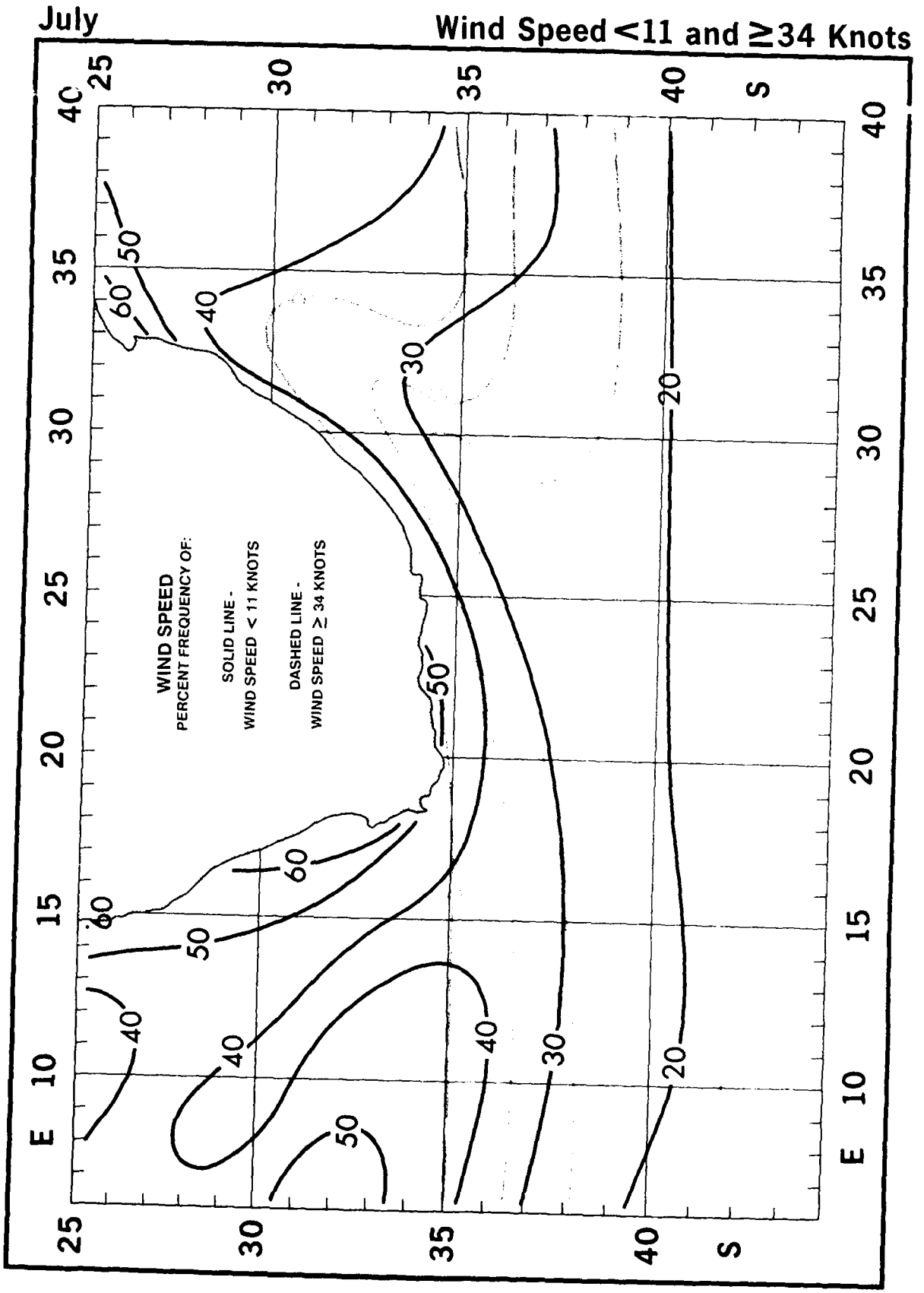
Wind - Visibility - Cloudiness



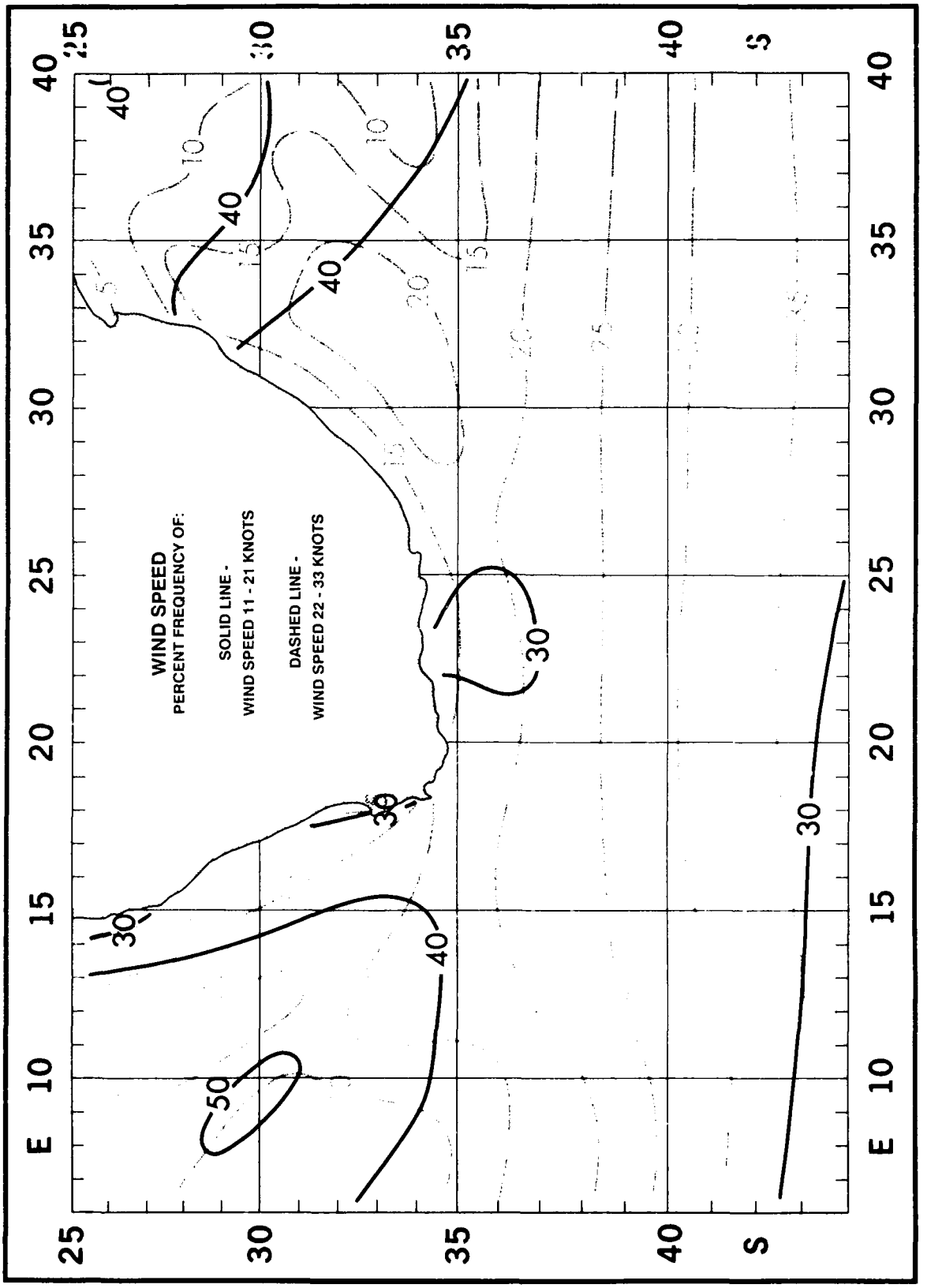
July

Mean Scalar Wind Speed



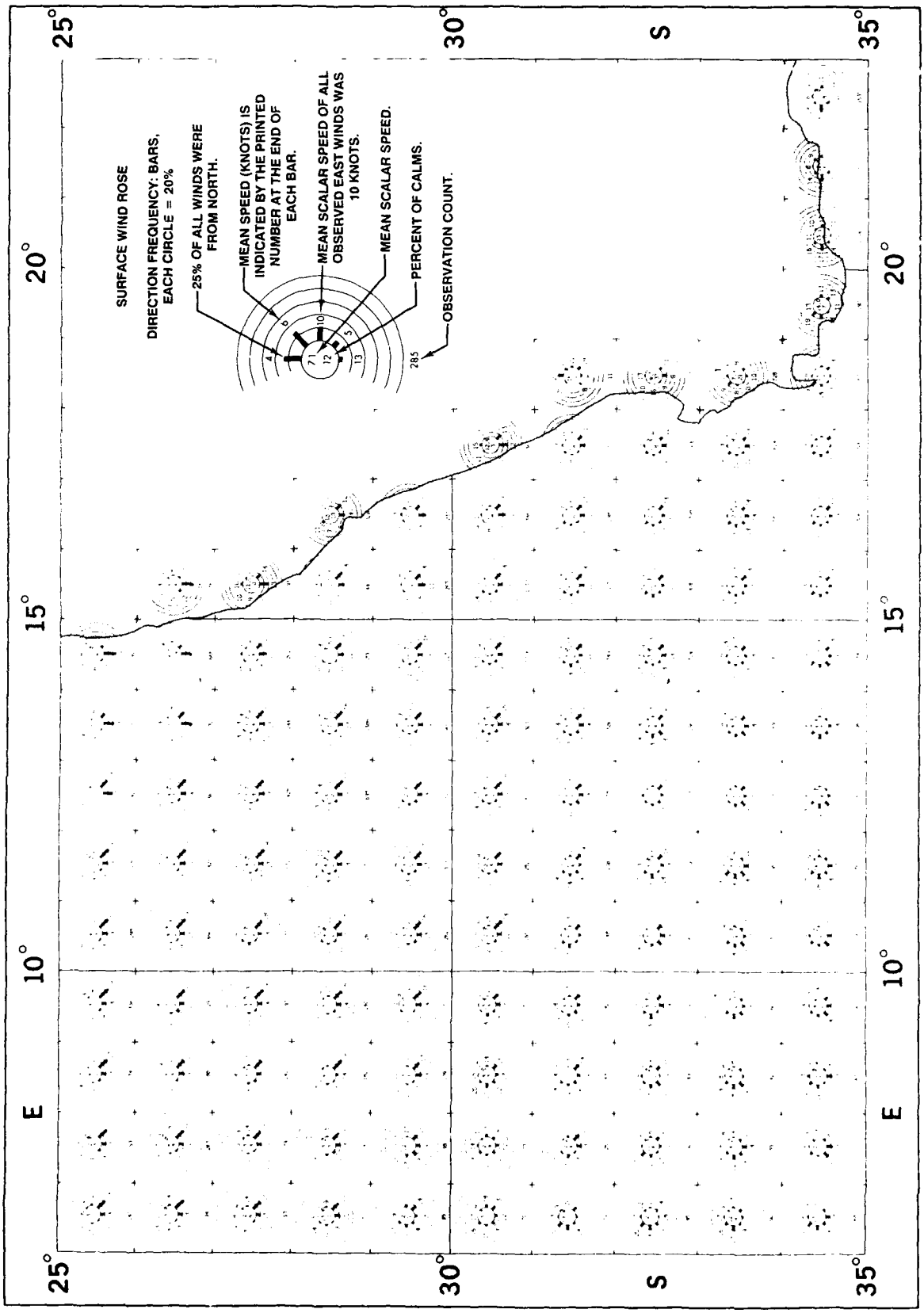

July
Wind Speed <11 and ≥34 Knots
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED < 11 KNOTS
DASHED LINE -
WIND SPEED ≥ 34 KNOTS
25
30
35
40
S
E 10
15
20
60
50
40
30
20

July **Wind Speed 11 - 21 and 22 - 33 Knots**



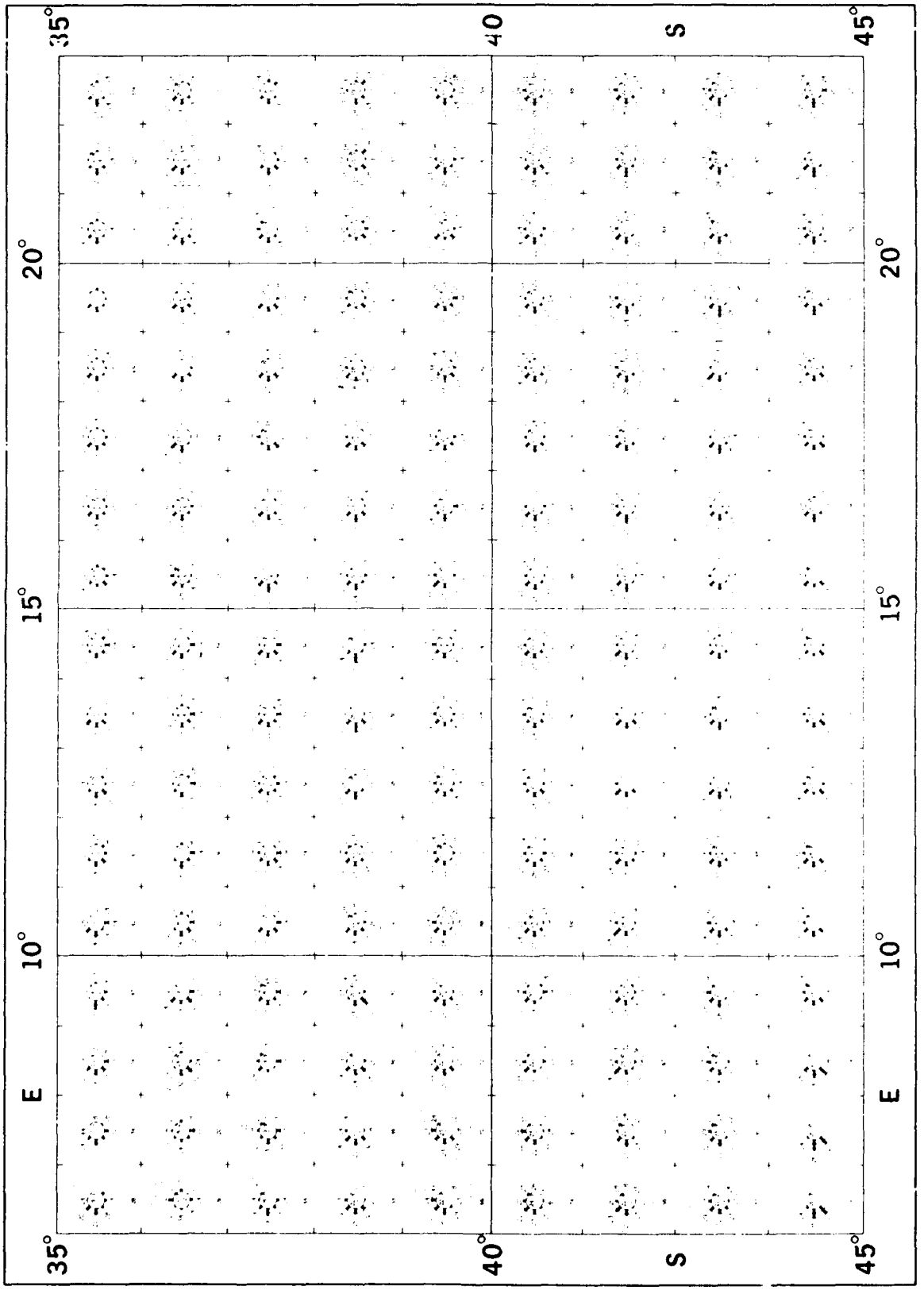
July

Surface Wind Roses



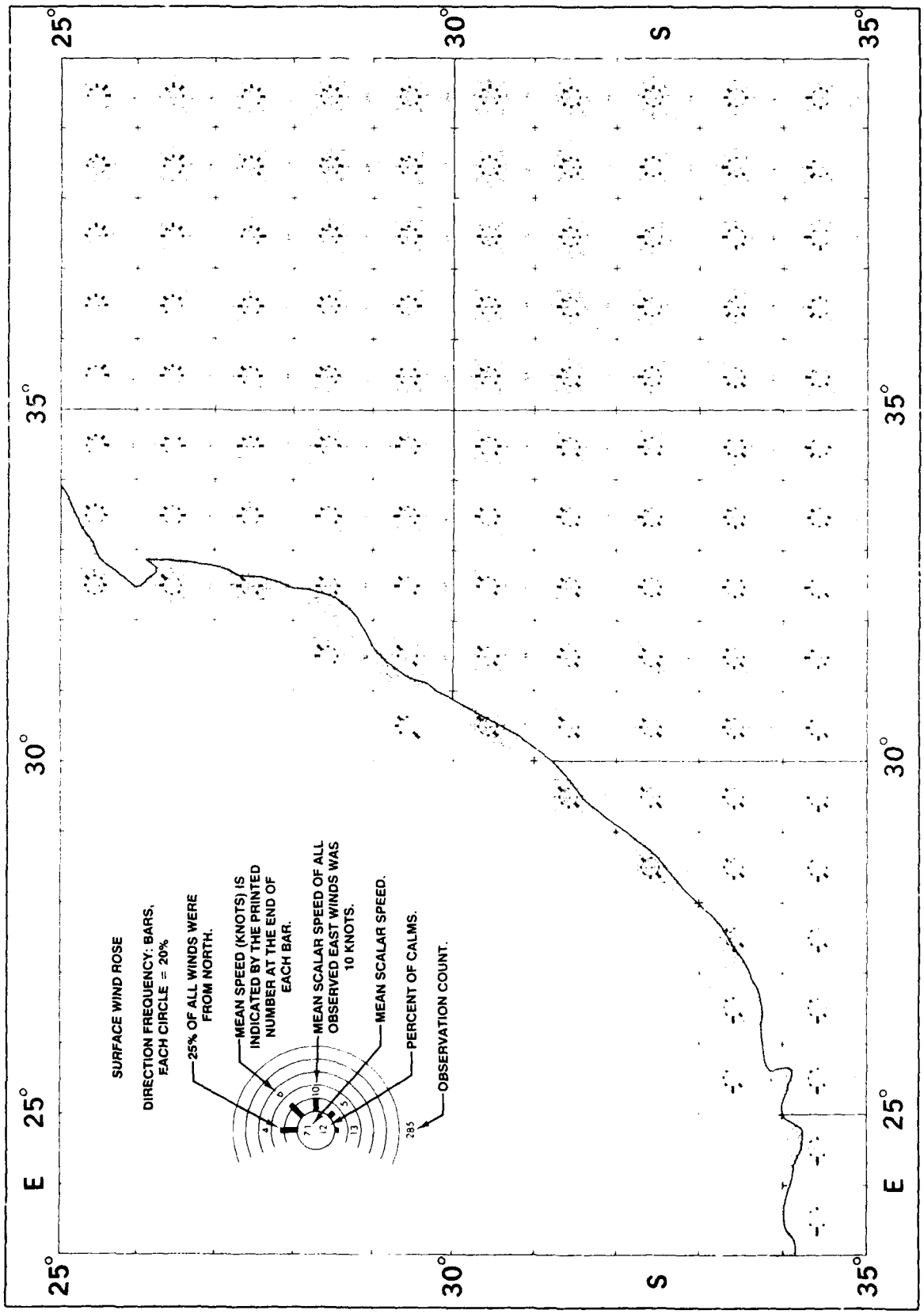
July

Surface Wind Roses



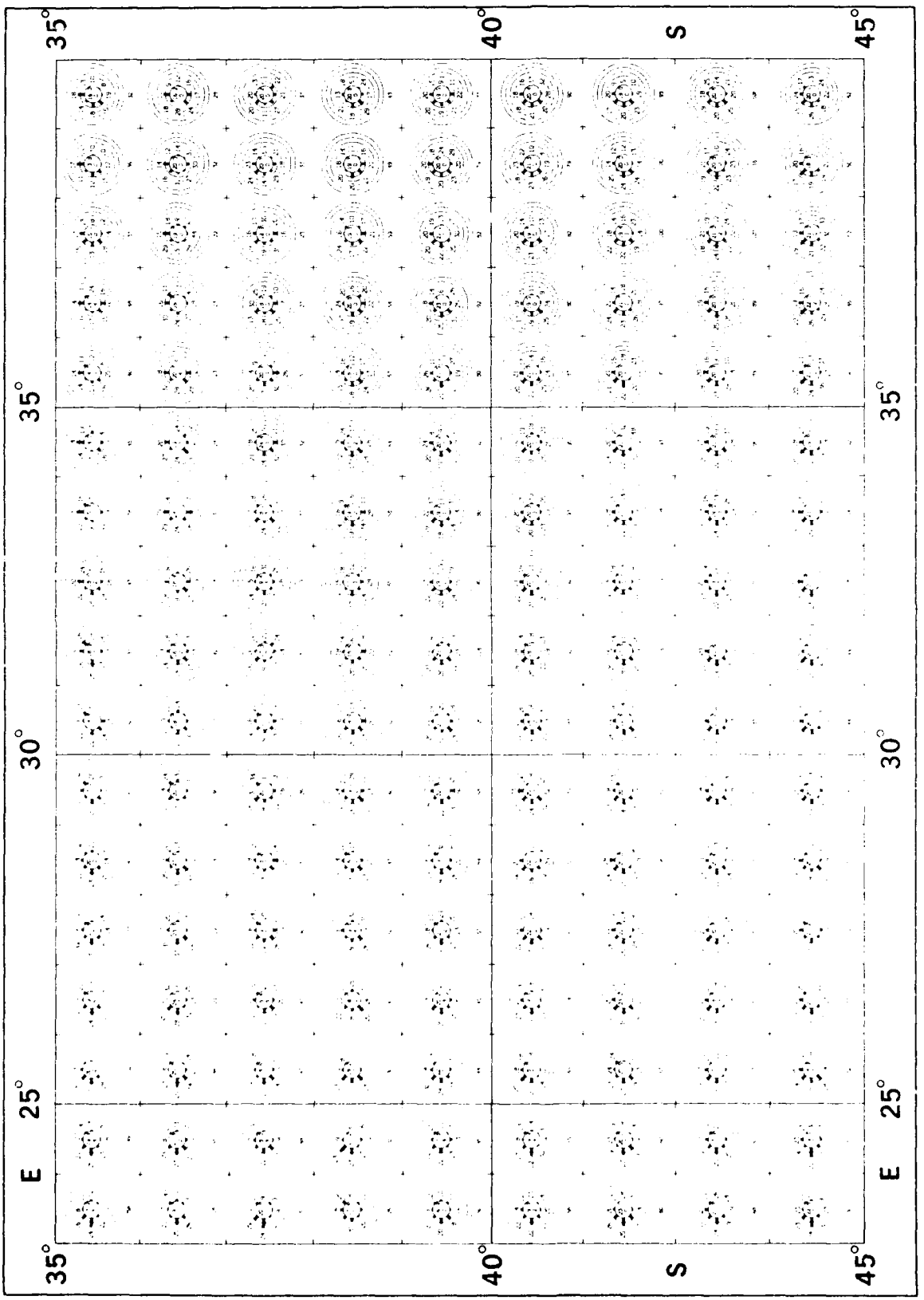
July

Surface Wind Roses



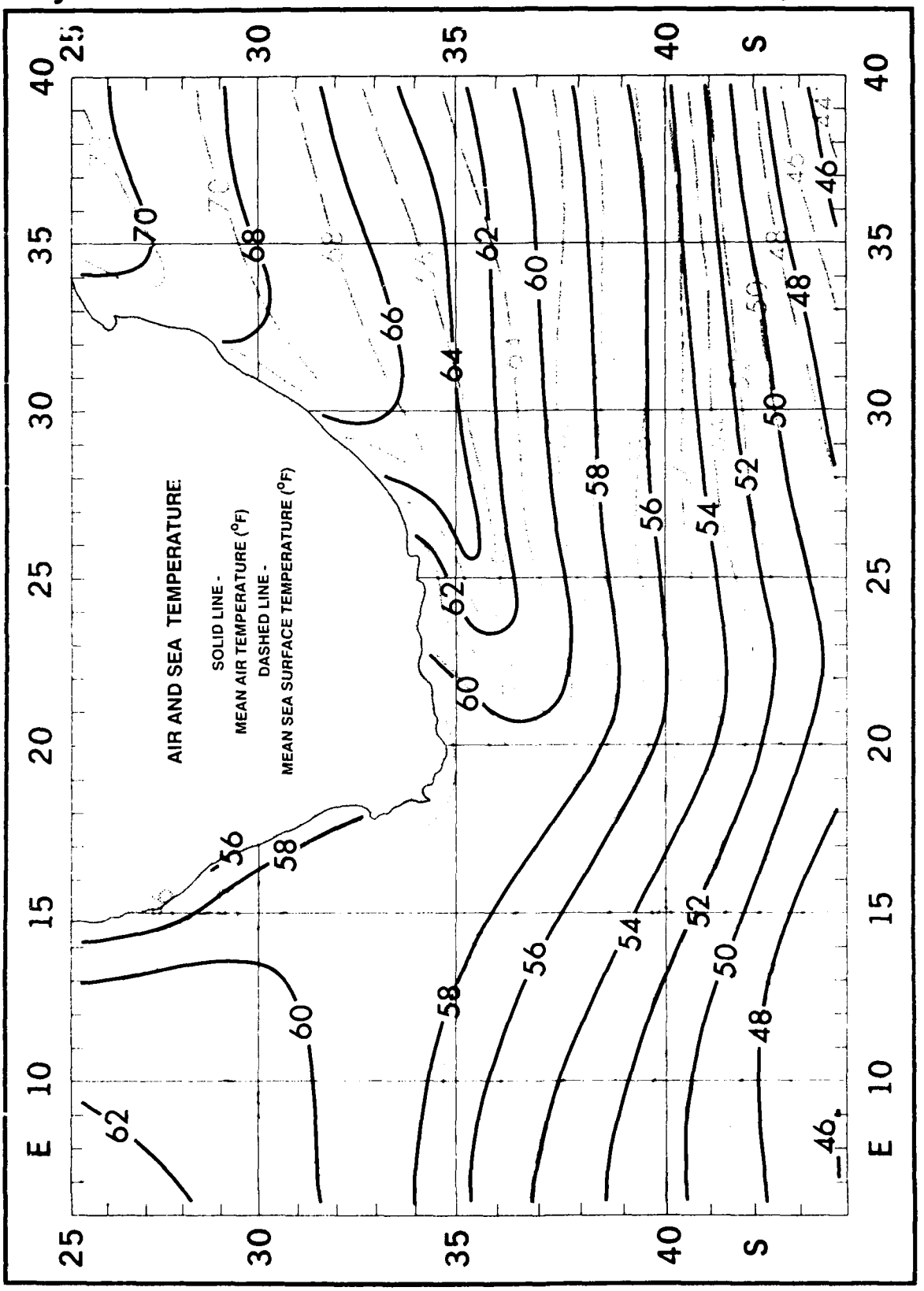
July

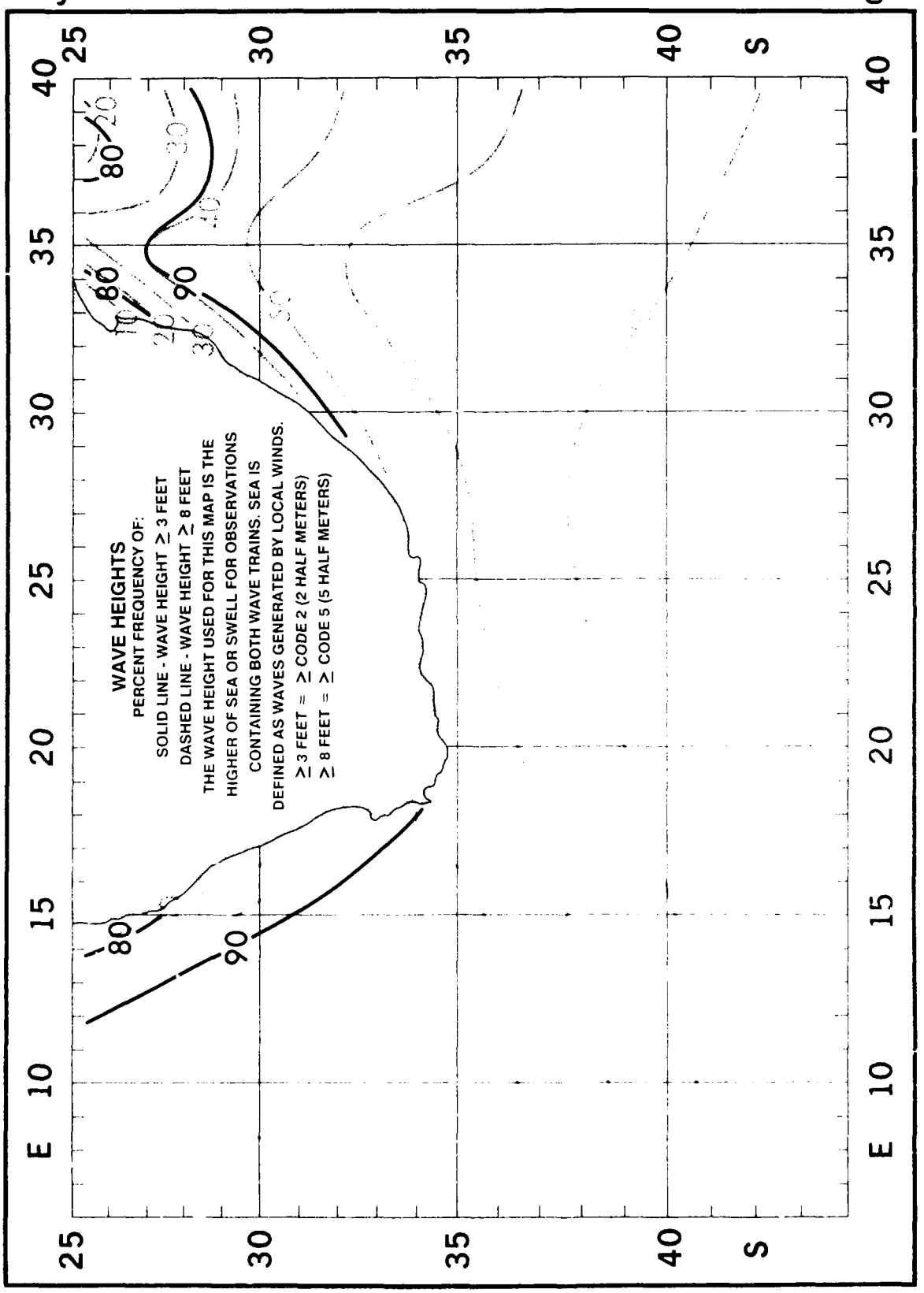
Surface Wind Roses

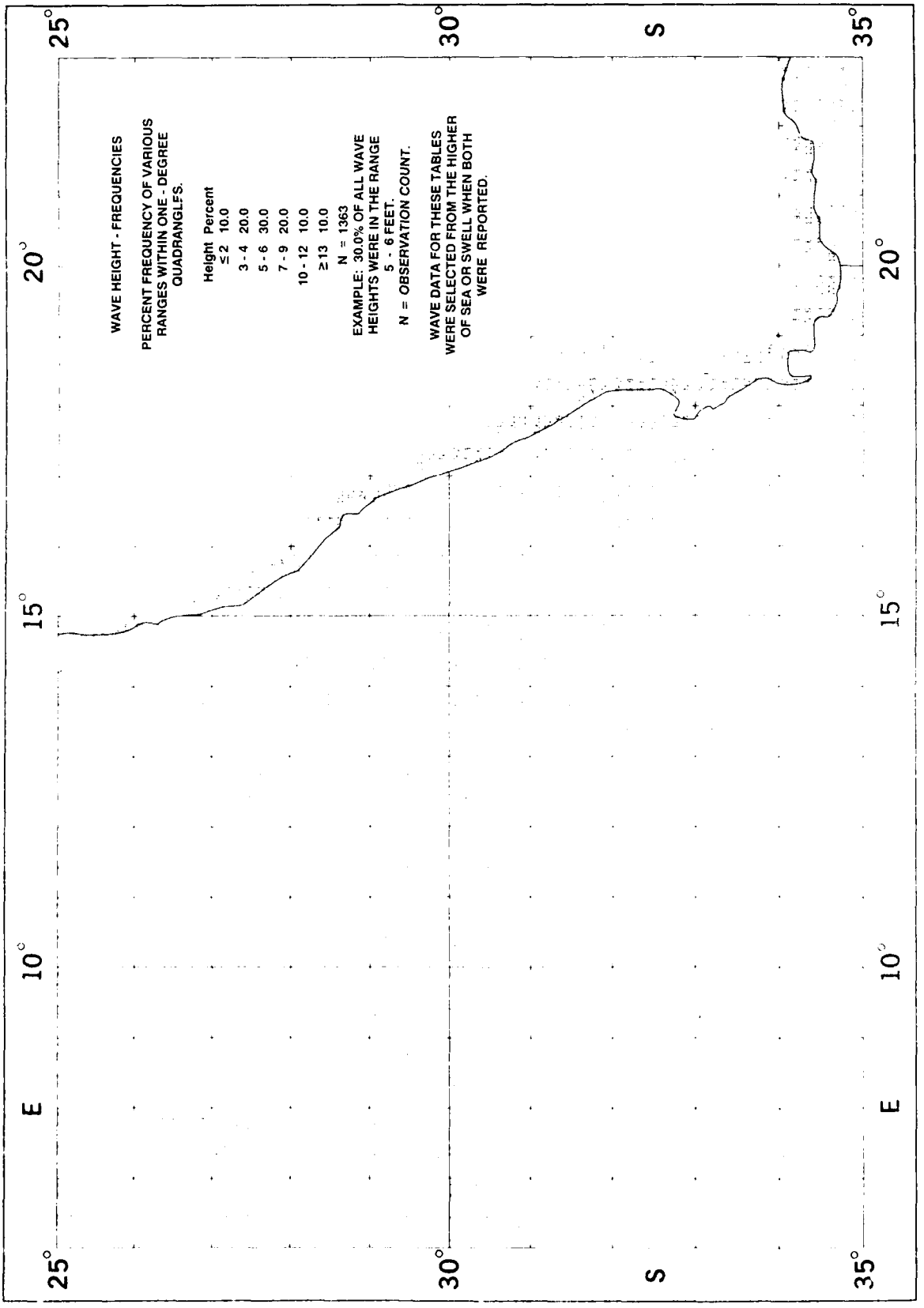


July

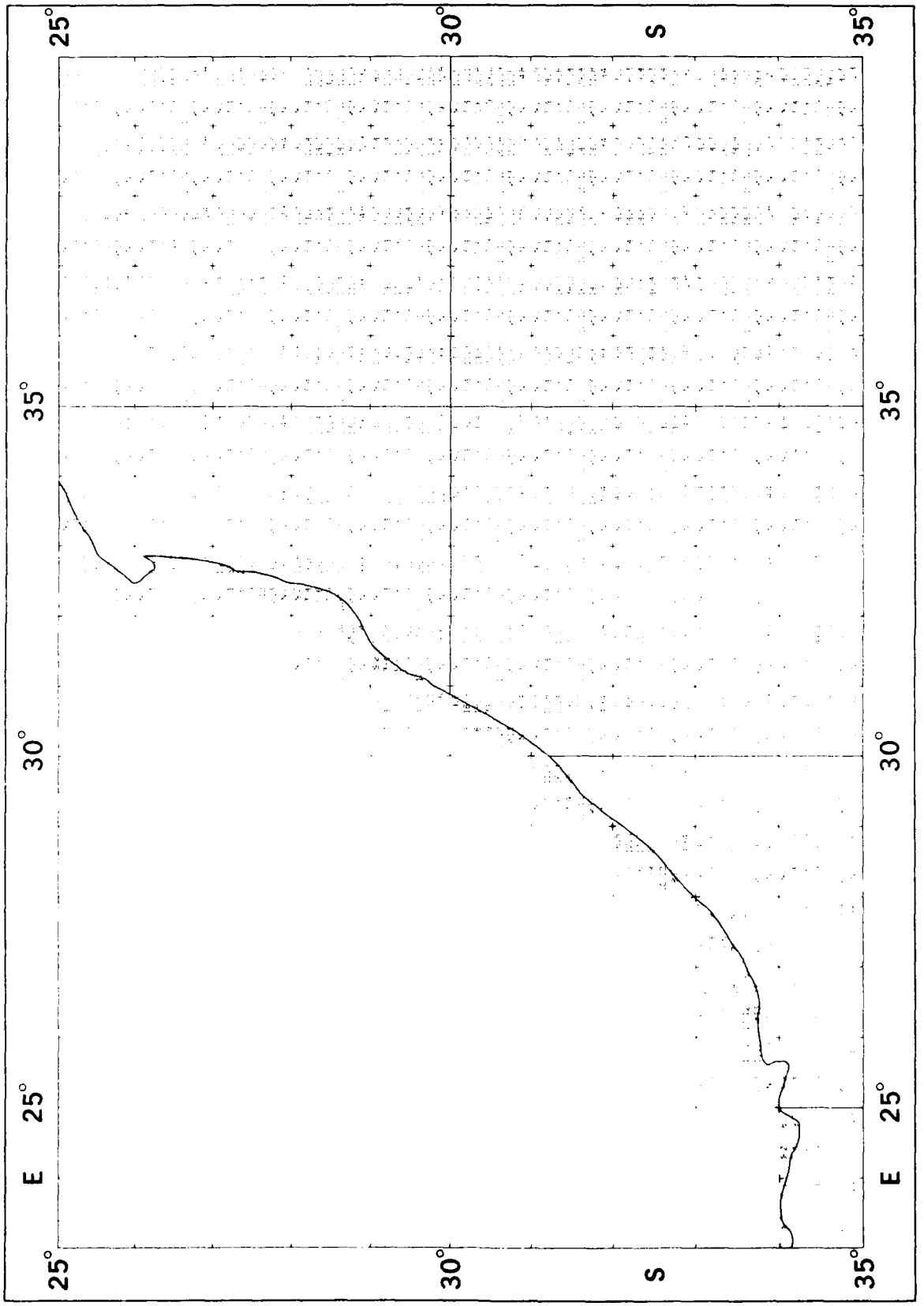
Air and Sea Temperature




WAVE HEIGHTS
PERCENT FREQUENCY OF:
SOLID LINE - WAVE HEIGHT ≥ 3 FEET
DASHED LINE - WAVE HEIGHT ≥ 8 FEET
THE WAVE HEIGHT USED FOR THIS MAP IS THE HIGHER OF SEA OR SWELL FOR OBSERVATIONS CONTAINING BOTH WAVE TRAINS. SEA IS DEFINED AS WAVES GENERATED BY LOCAL WINDS.
≥ 3 FEET = ≥ CODE 2 (2 HALF METERS)
≥ 8 FEET = ≥ CODE 5 (5 HALF METERS)
80
90
10
20
30
40
50
E
S
25
30
35
40

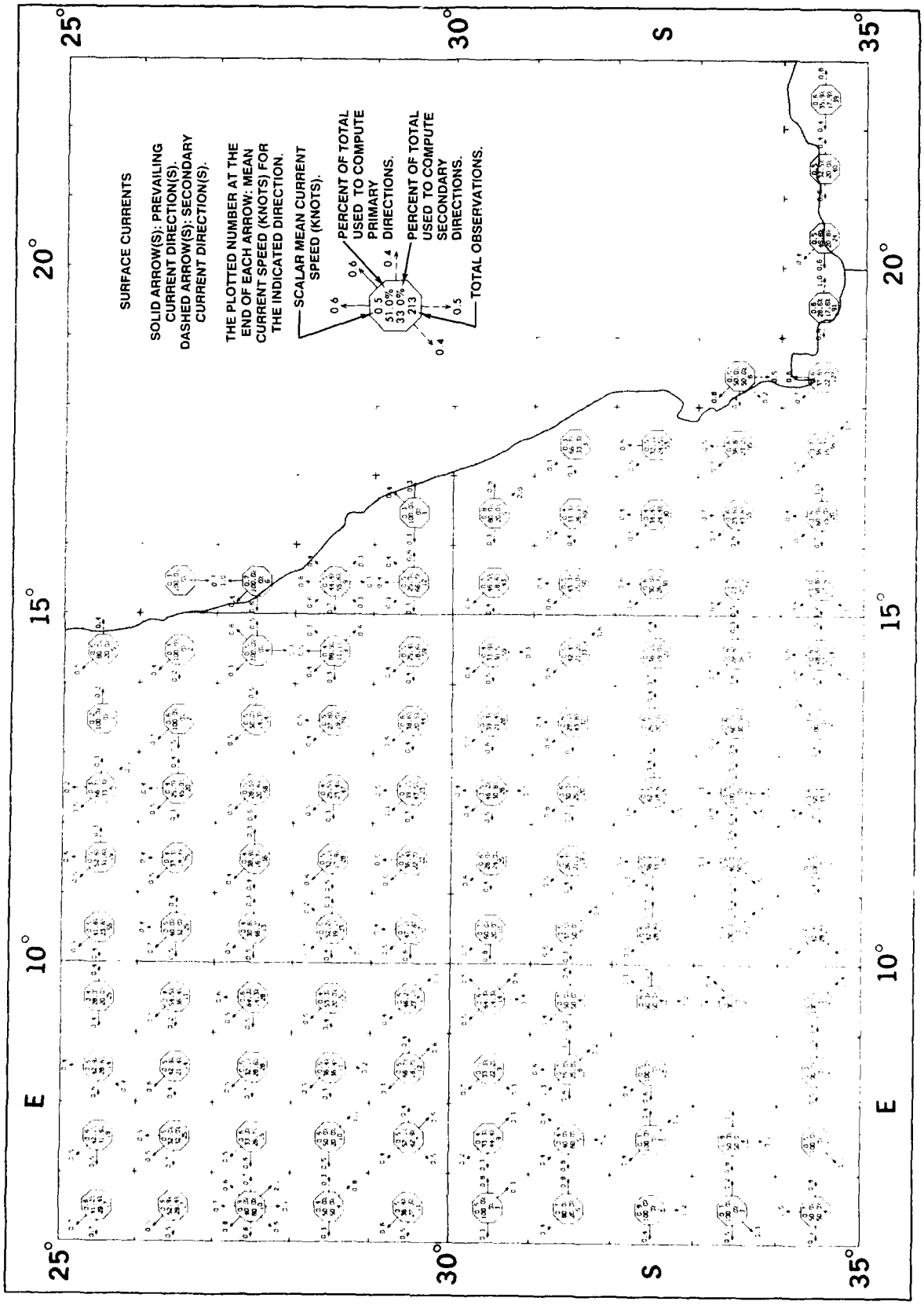

WAVE HEIGHT - FREQUENCIES
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE - DEGREE QUADRANGLES.
Height Percent
≤2 10.0
3 - 4 20.0
5 - 6 30.0
7 - 9 20.0
10 - 12 10.0
≥13 10.0
N = 1363
EXAMPLE: 30.0% OF ALL WAVE HEIGHTS WERE IN THE RANGE 5 - 6 FEET.
N = OBSERVATION COUNT.
WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.
25°
30°
35°
S
20°
15°
10°
E

July **Wave Height**

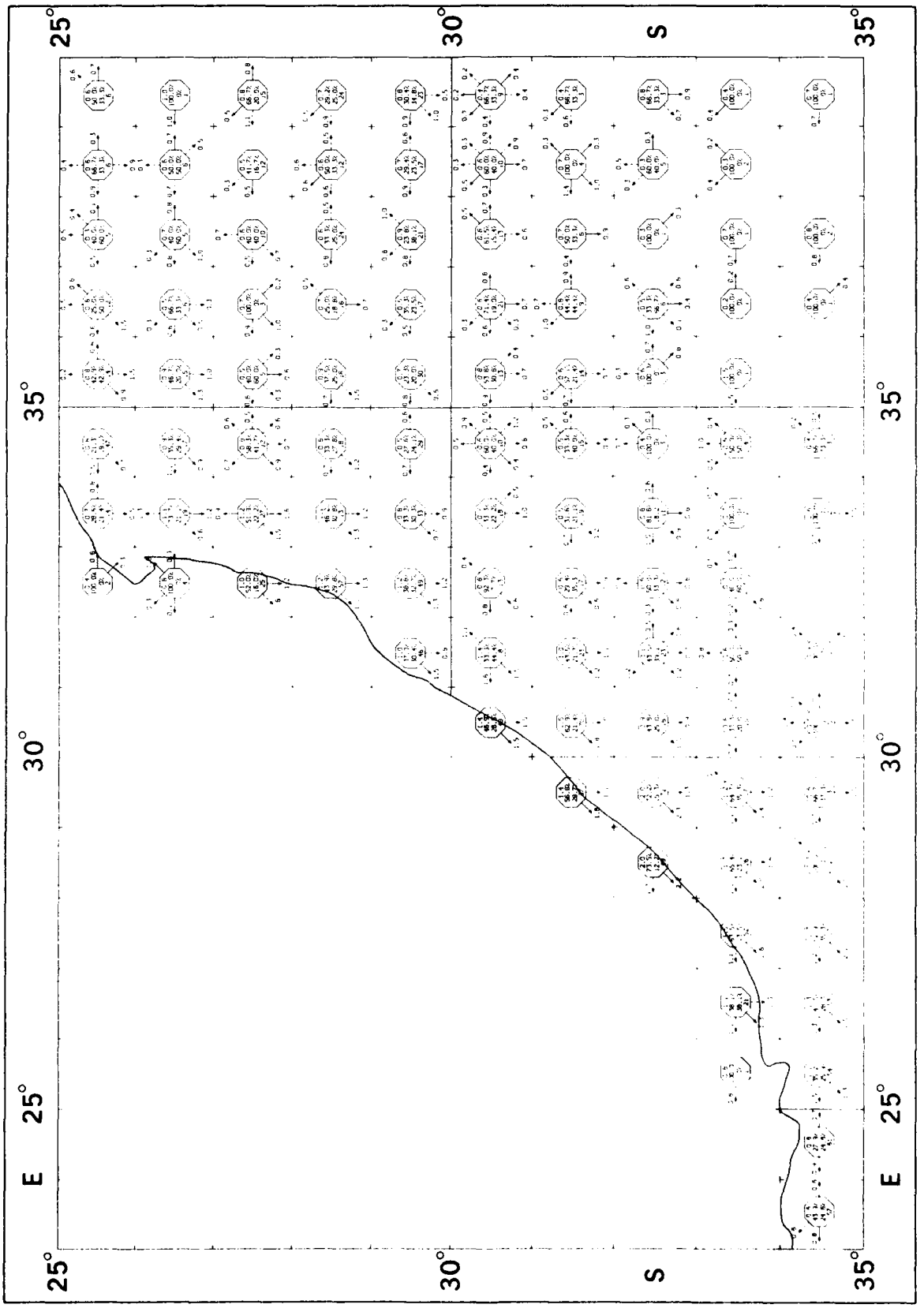


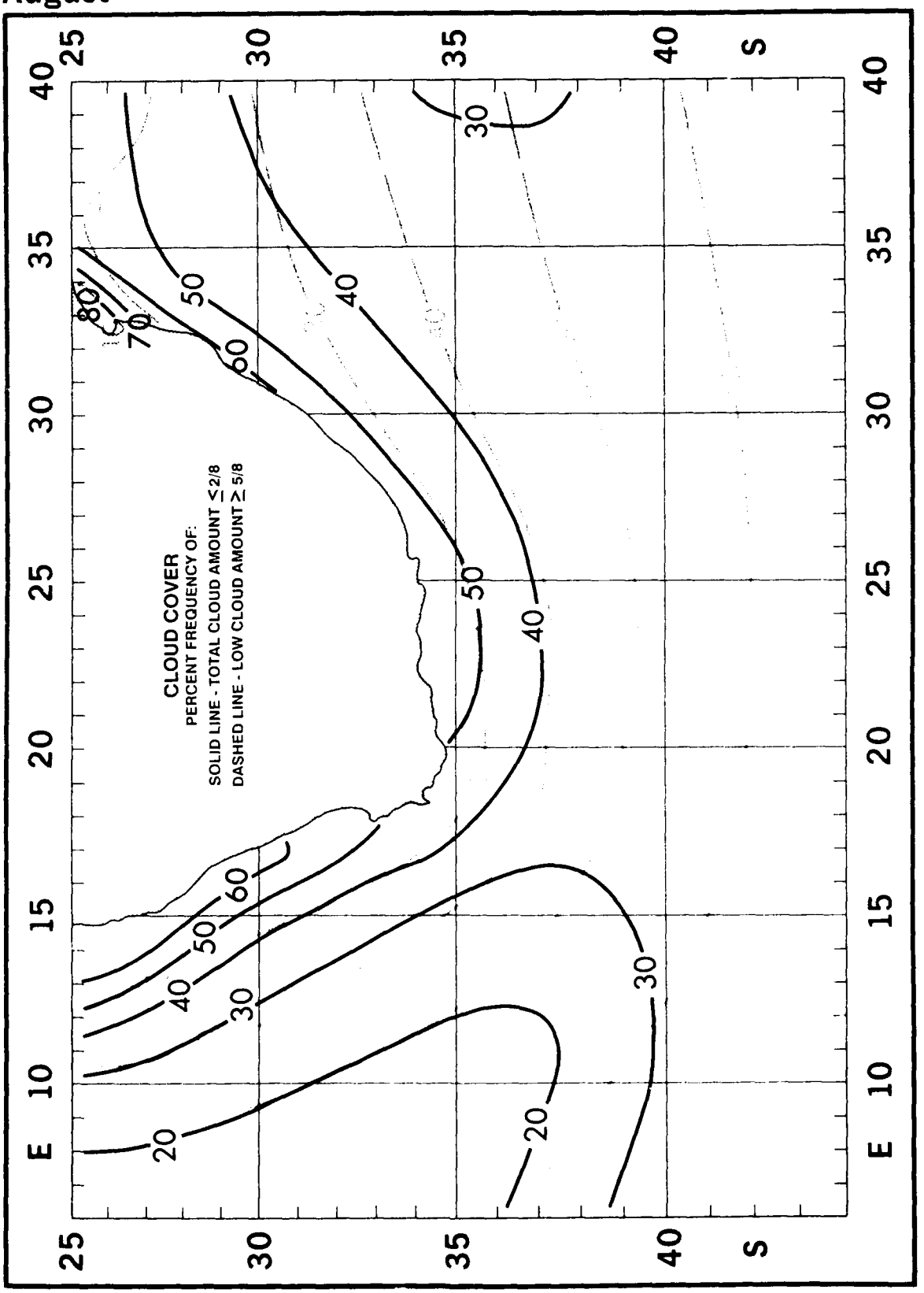
July

Surface Currents



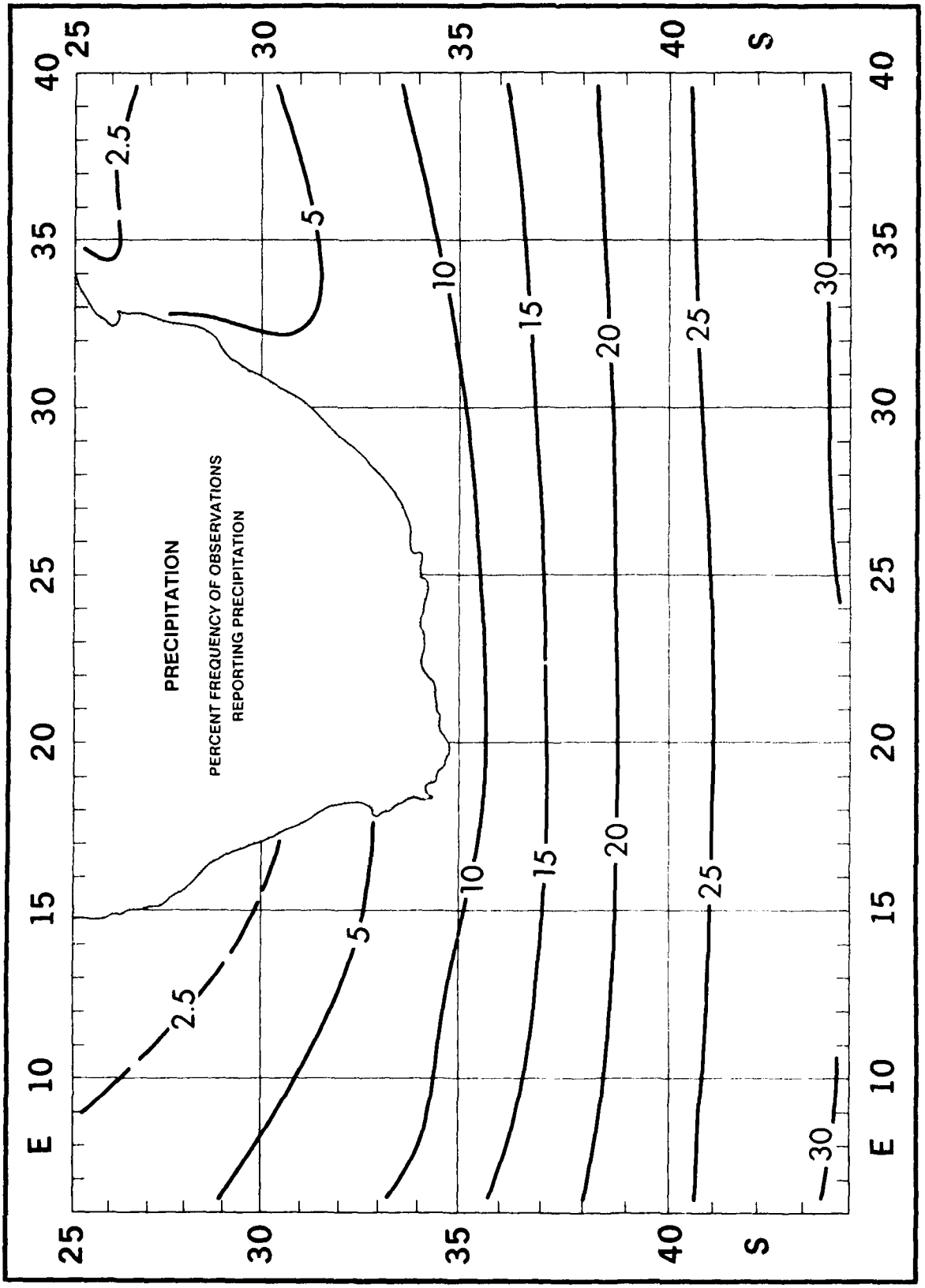
July **Surface Currents**




CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE - TOTAL CLOUD AMOUNT ≤ 2/8
DASHED LINE - LOW CLOUD AMOUNT ≥ 5/8
80
70
60
50
40
30
20
25
30
35
40
S
E
10
15
20
25
30
35
40

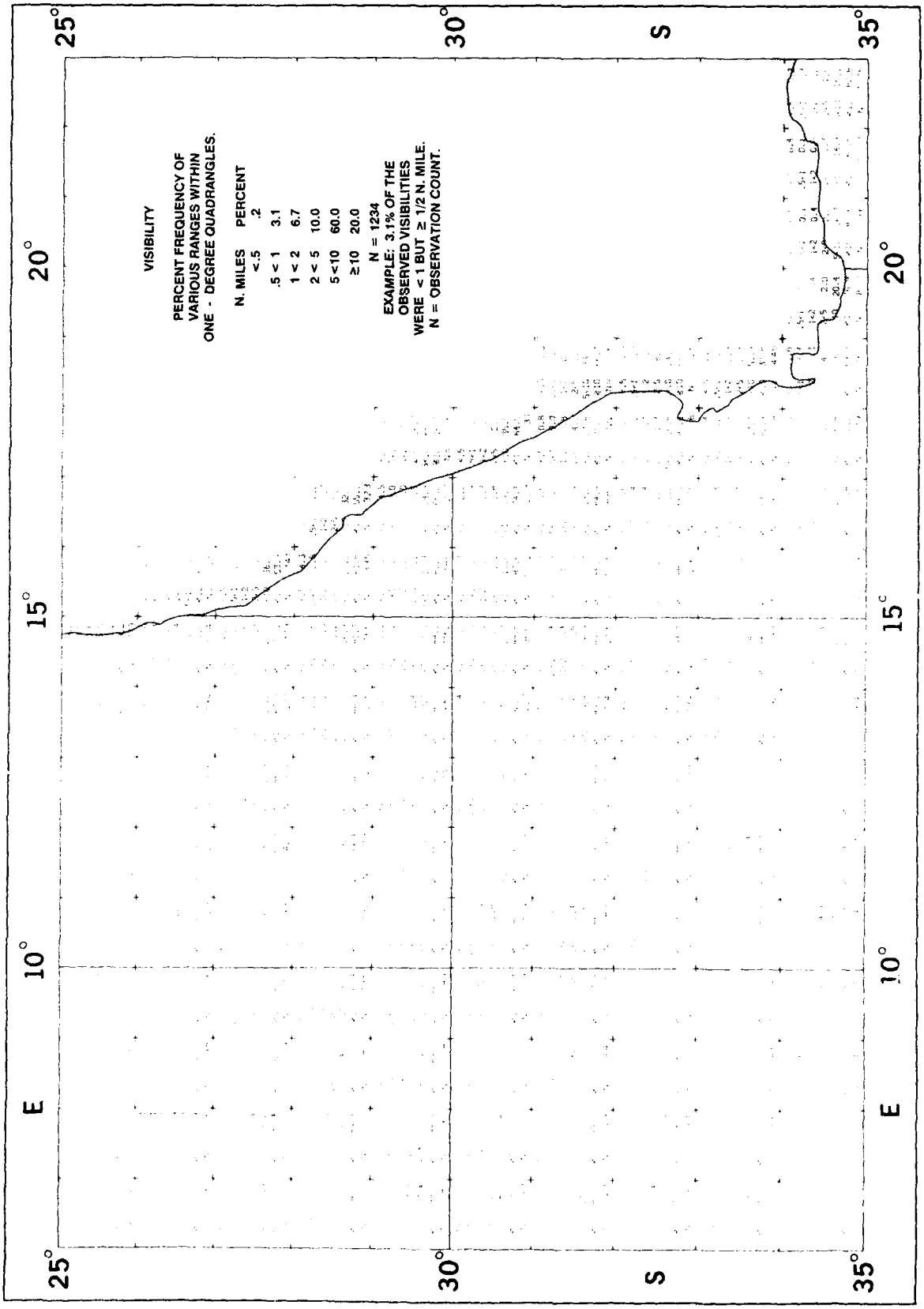
August

Precipitation

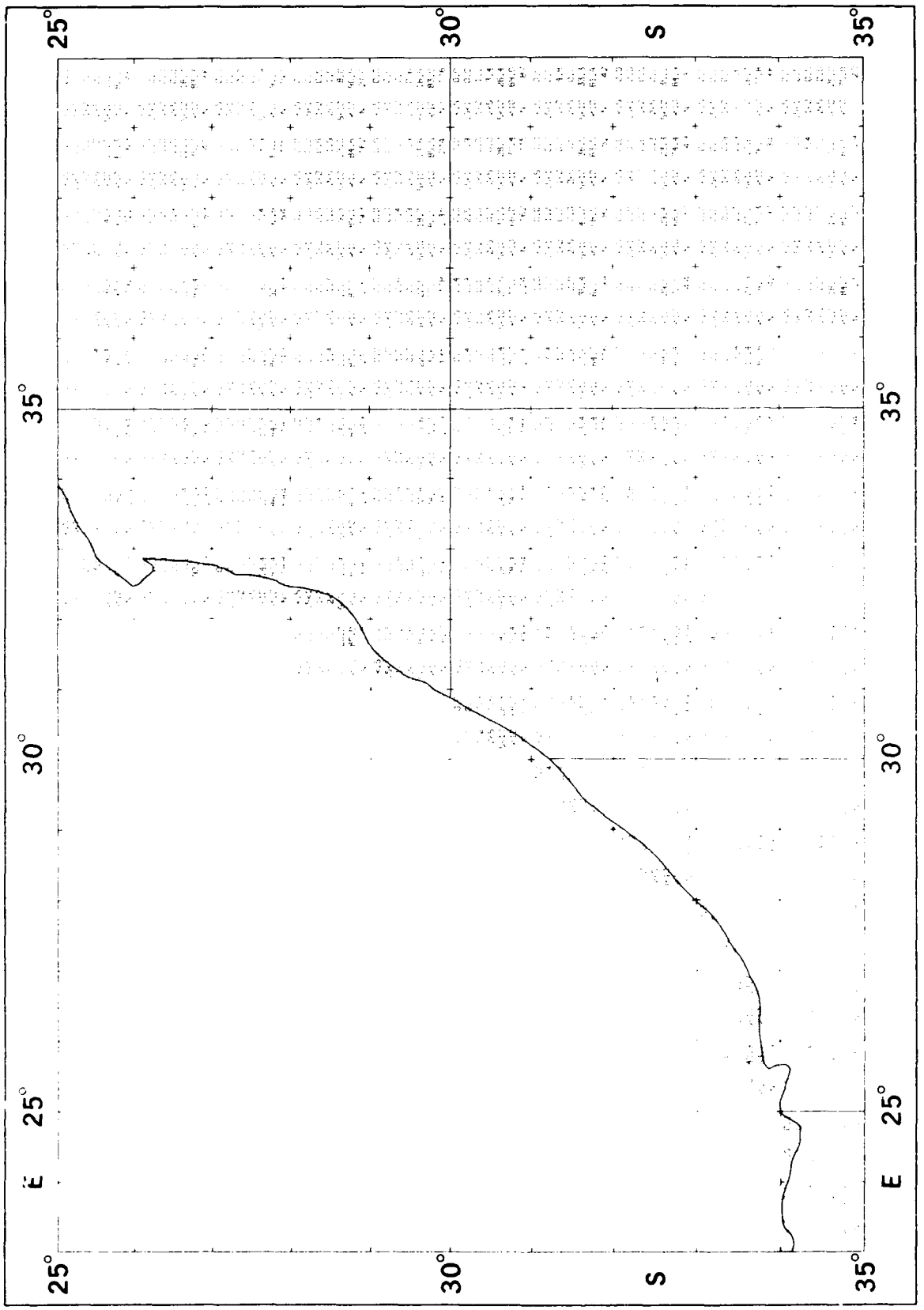


August

Visibility

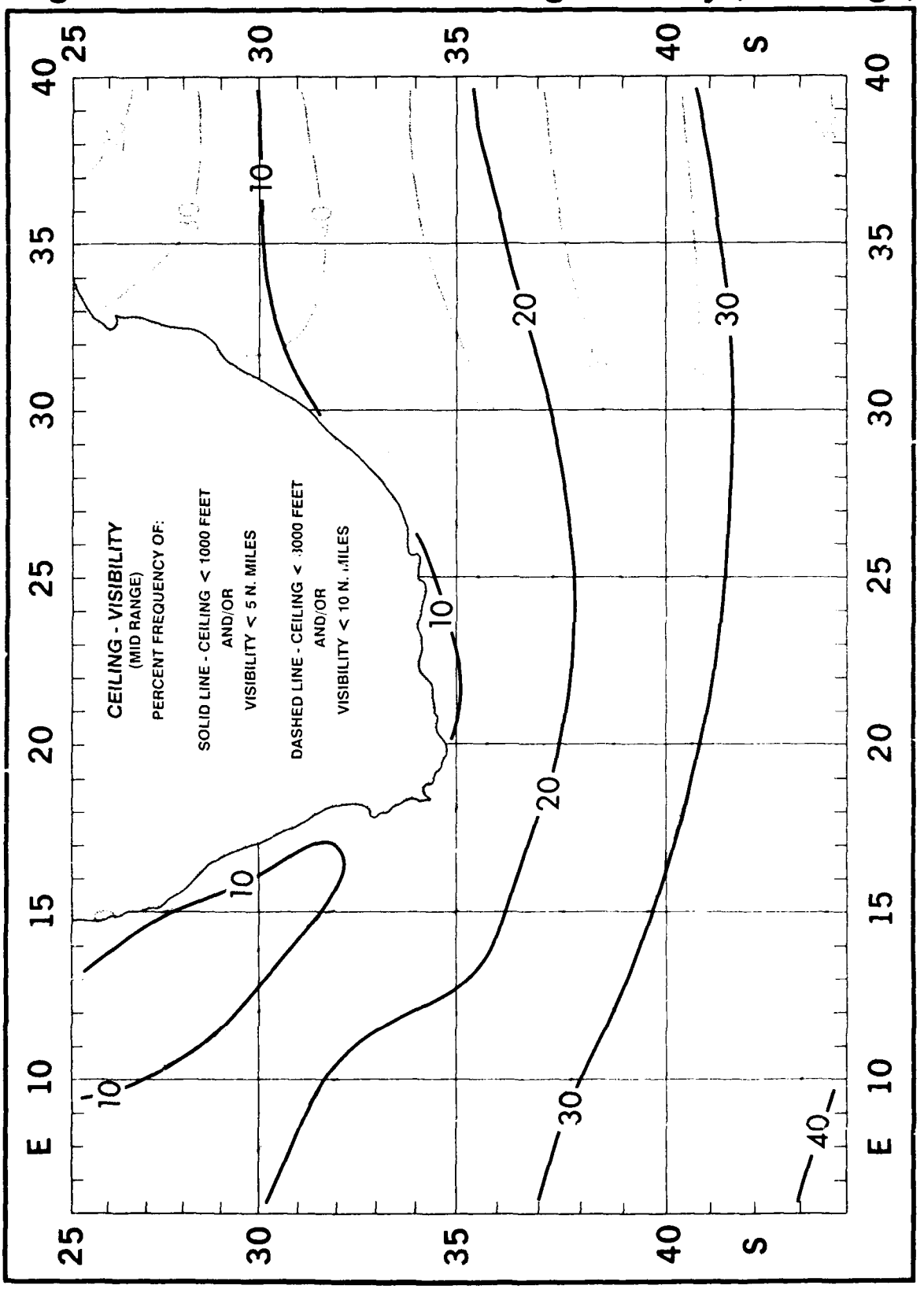


August **Visibility**

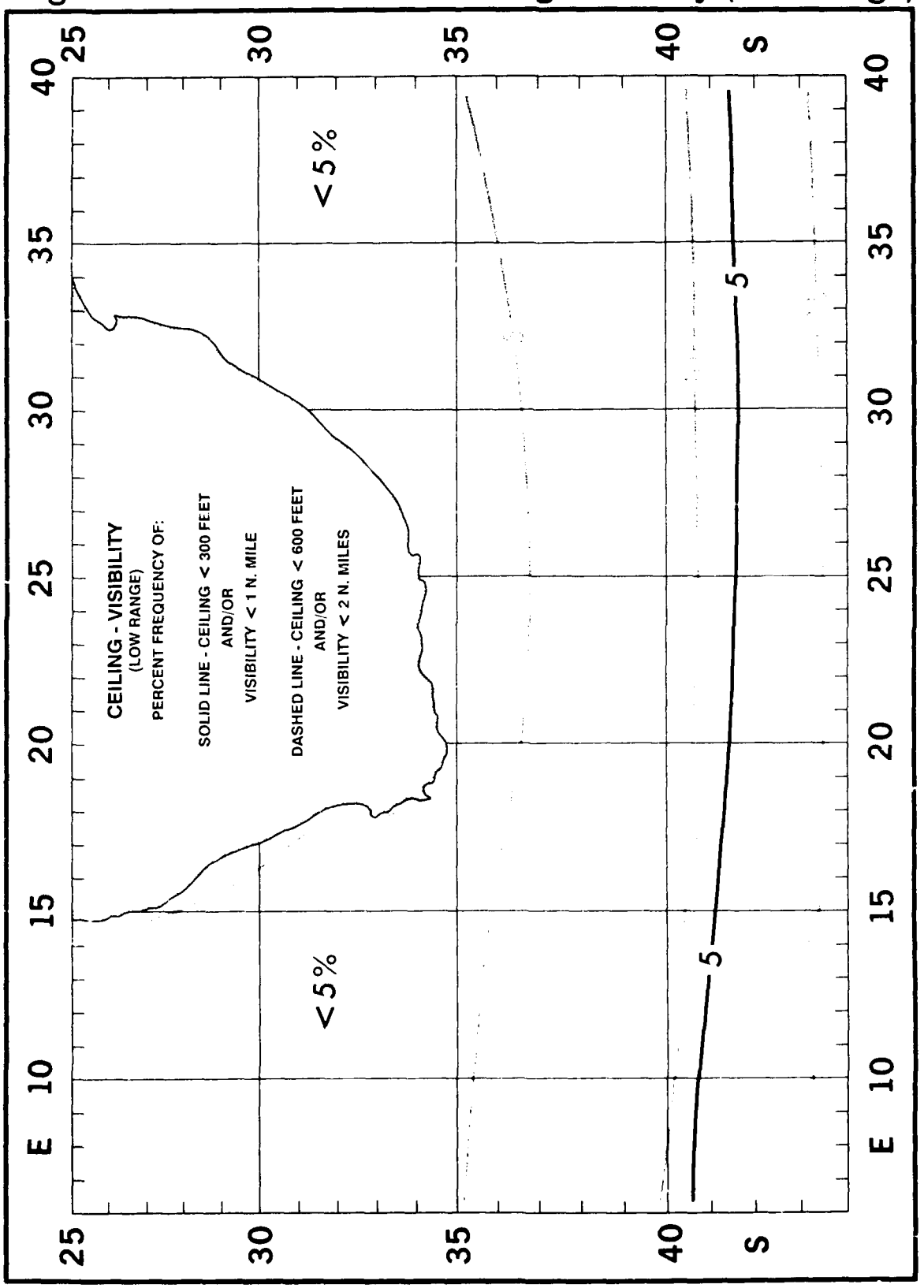


August

Ceiling - Visibility (Mid Range)

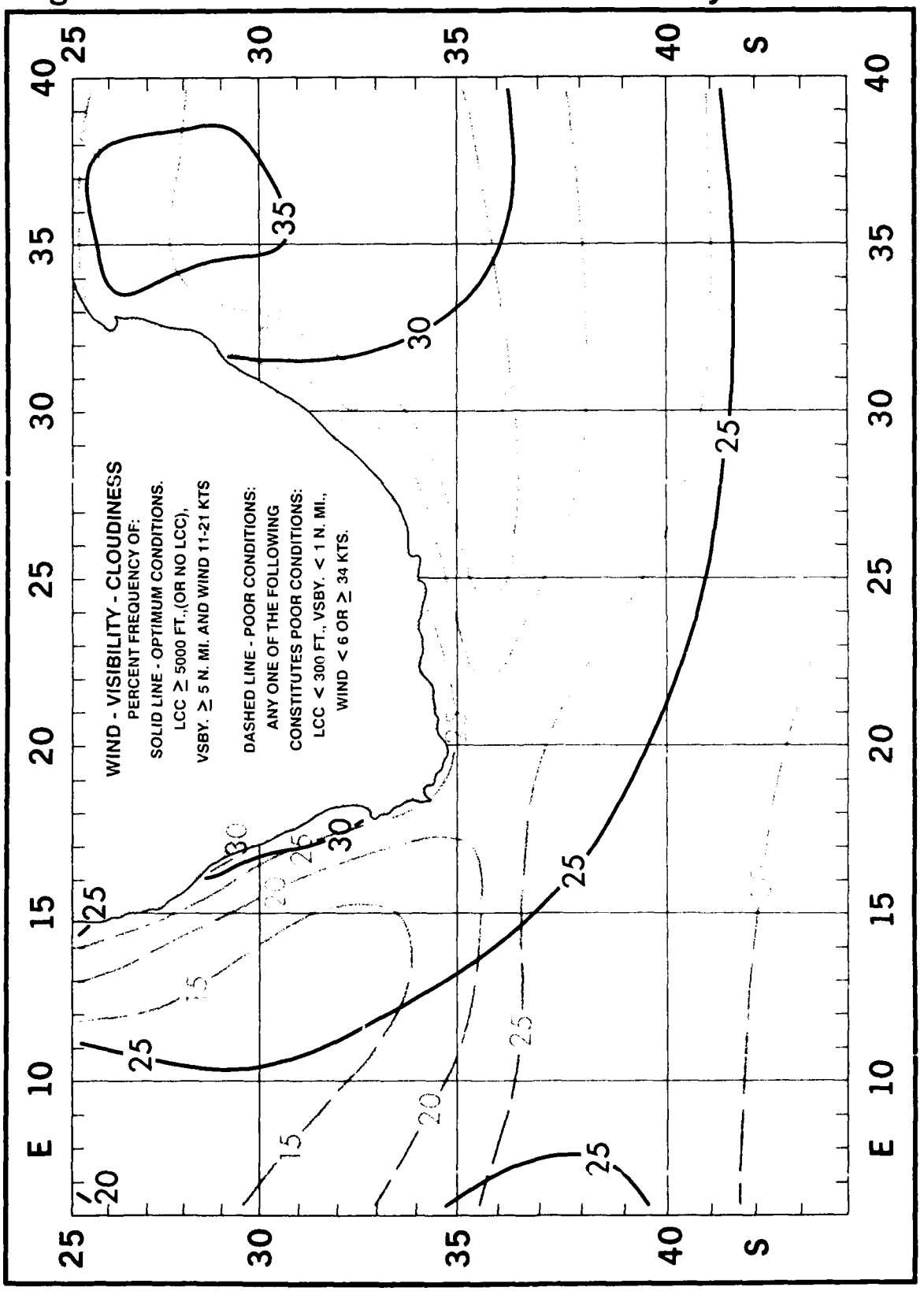


August **Ceiling - Visibility (Low Range)**

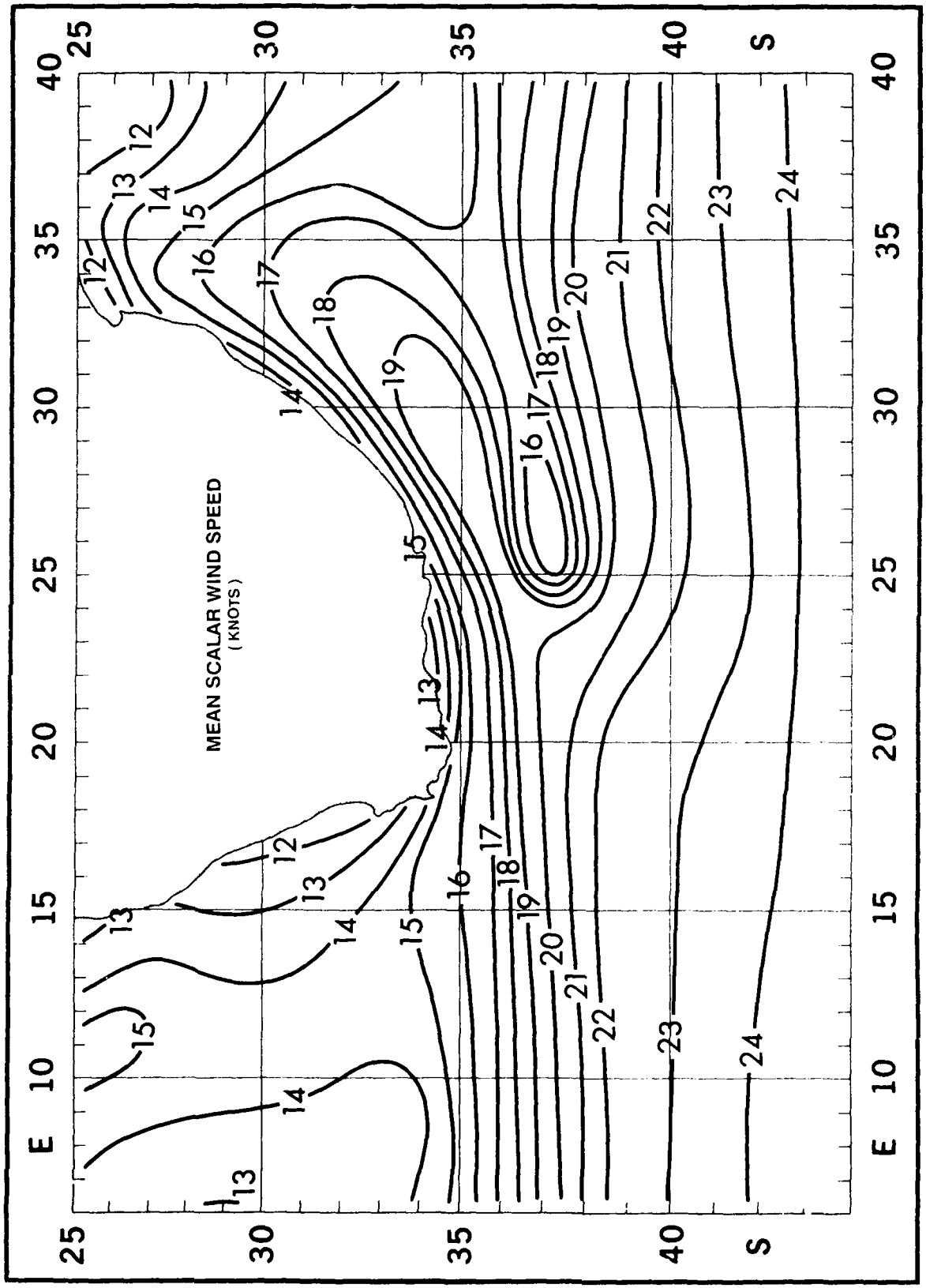


August

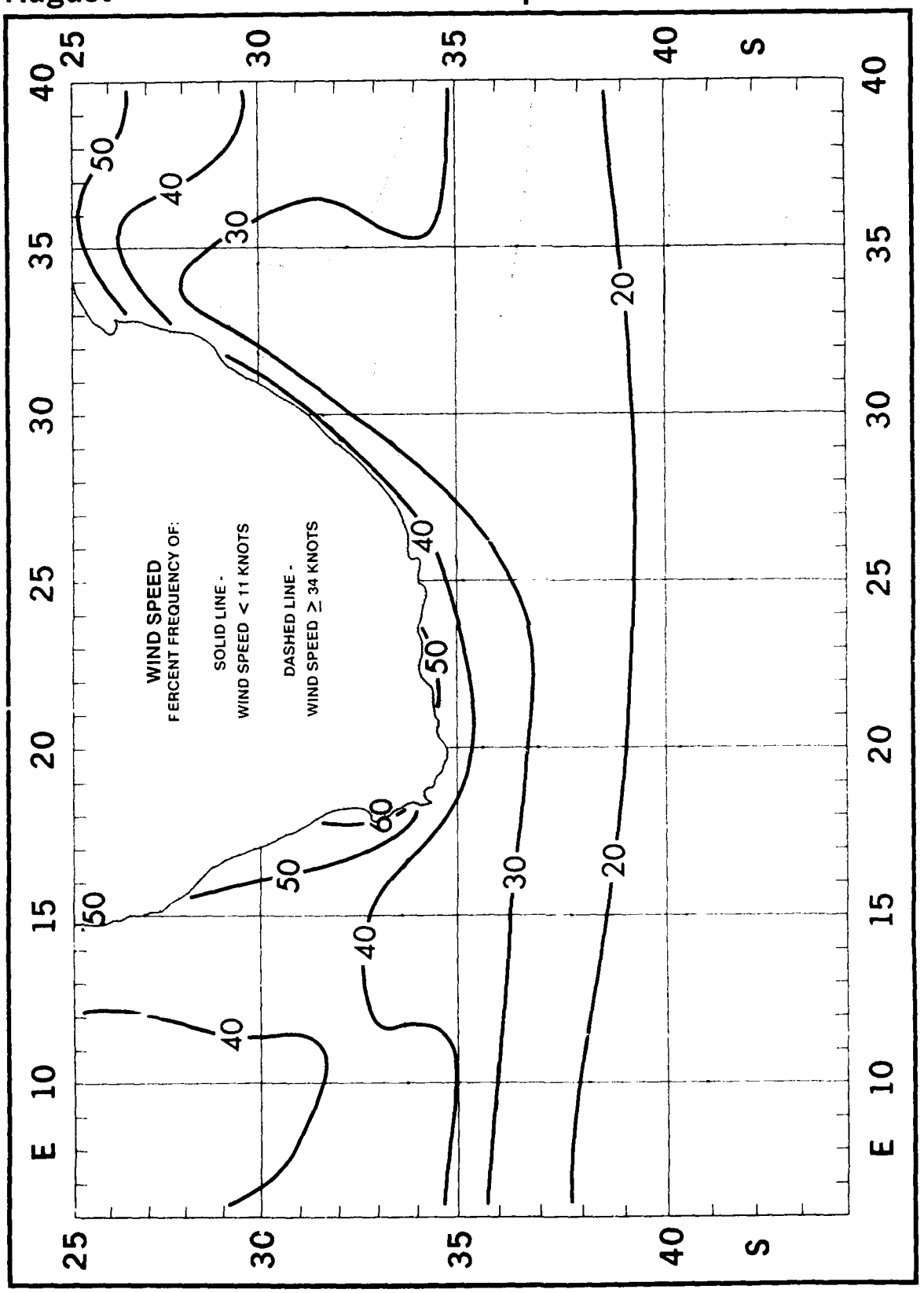
Wind - Visibility - Cloudiness



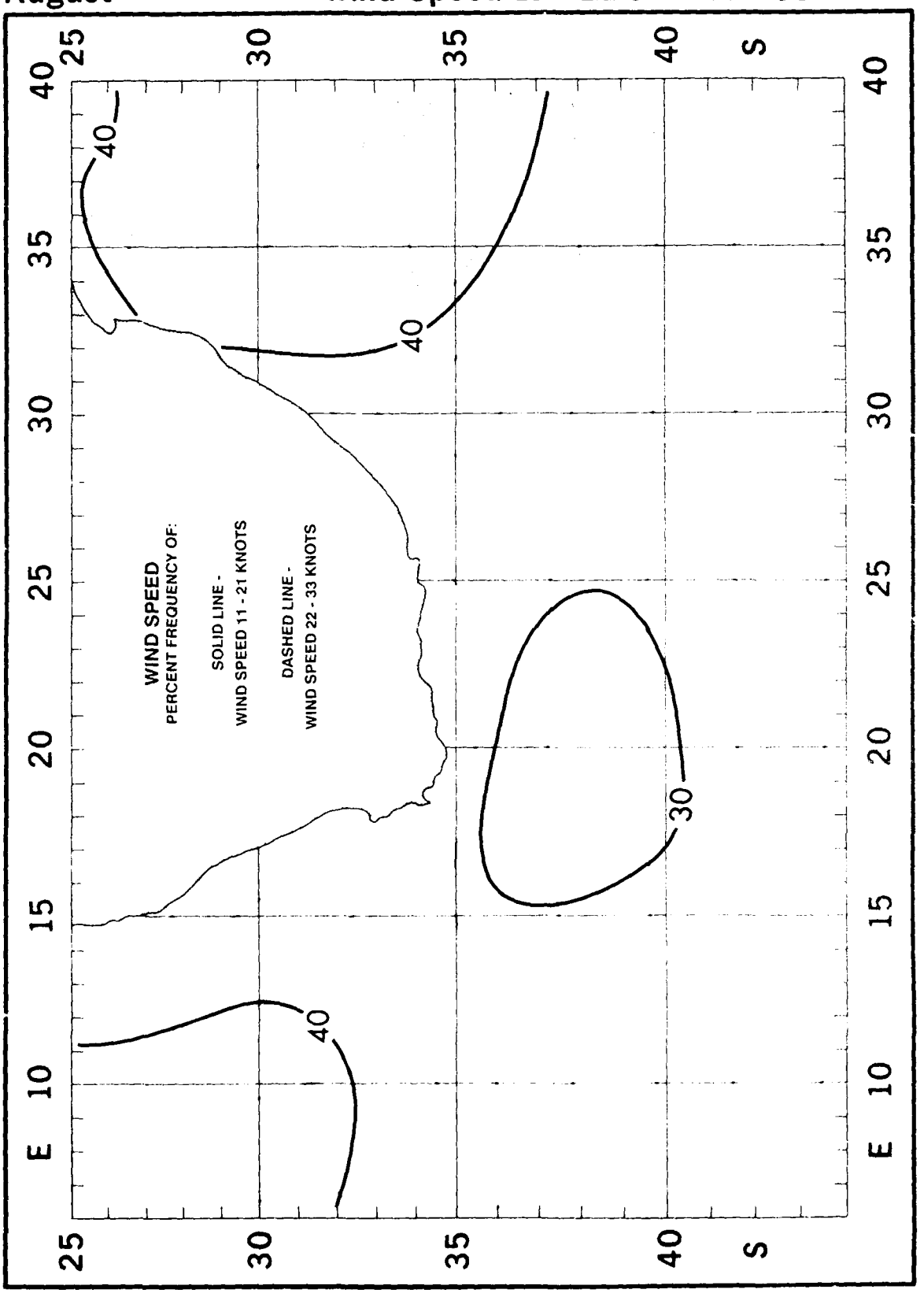
August **Mean Scalar Wind Speed**



August **Wind Speed ≤11 and ≥34 Knots**

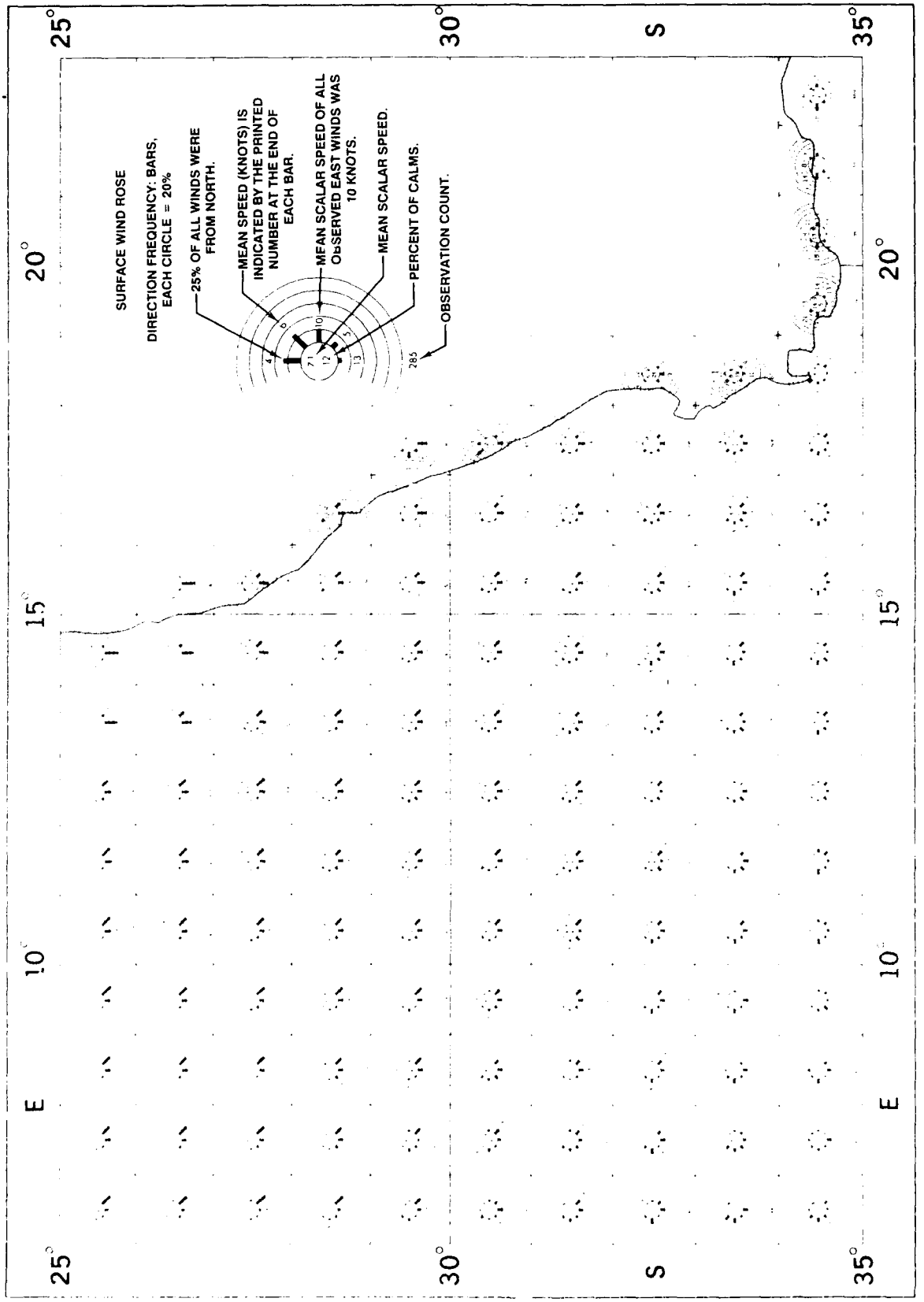


August **Wind Speed 11 - 21 and 22 - 33 Knots**



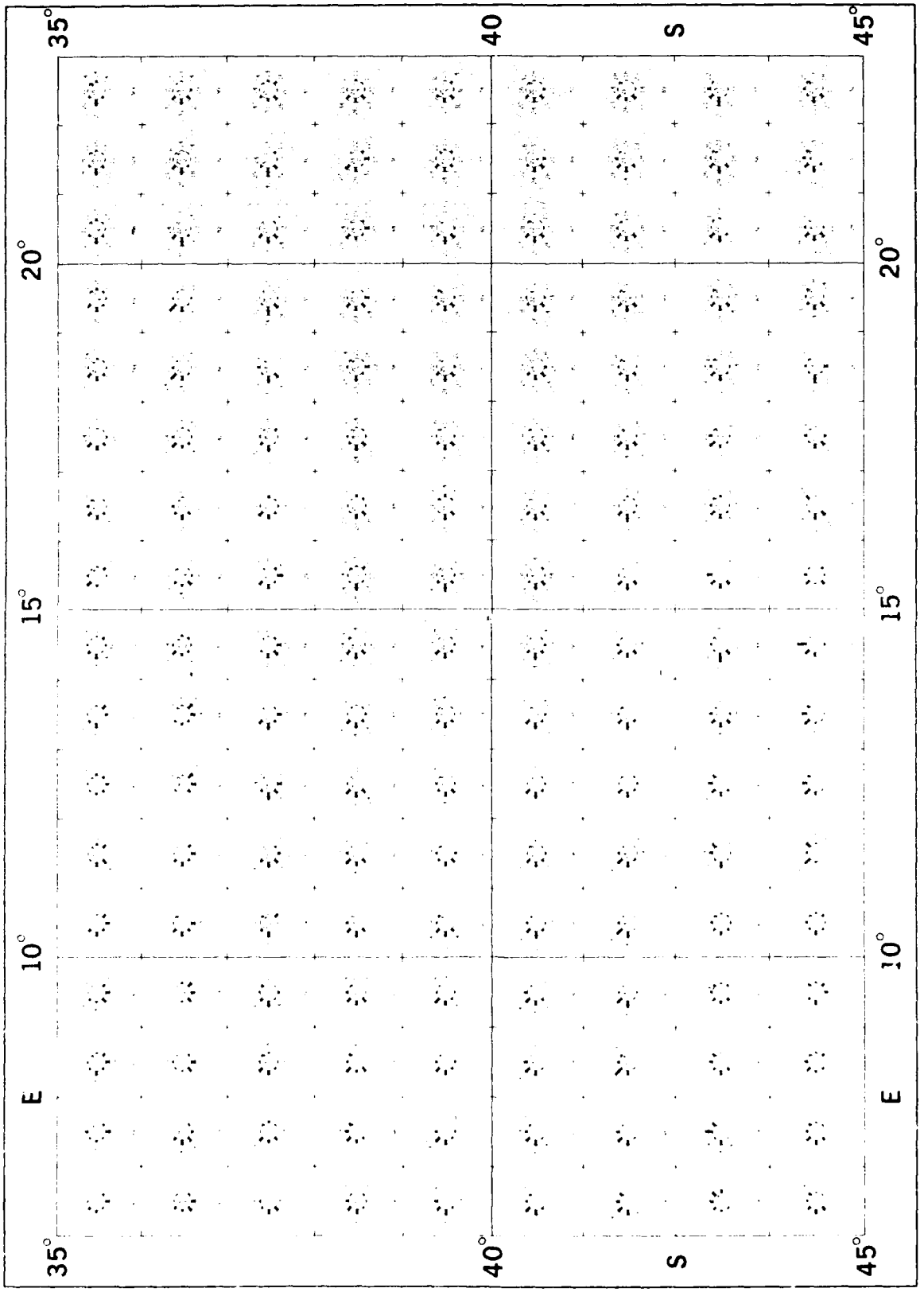
August

Surface Wind Roses



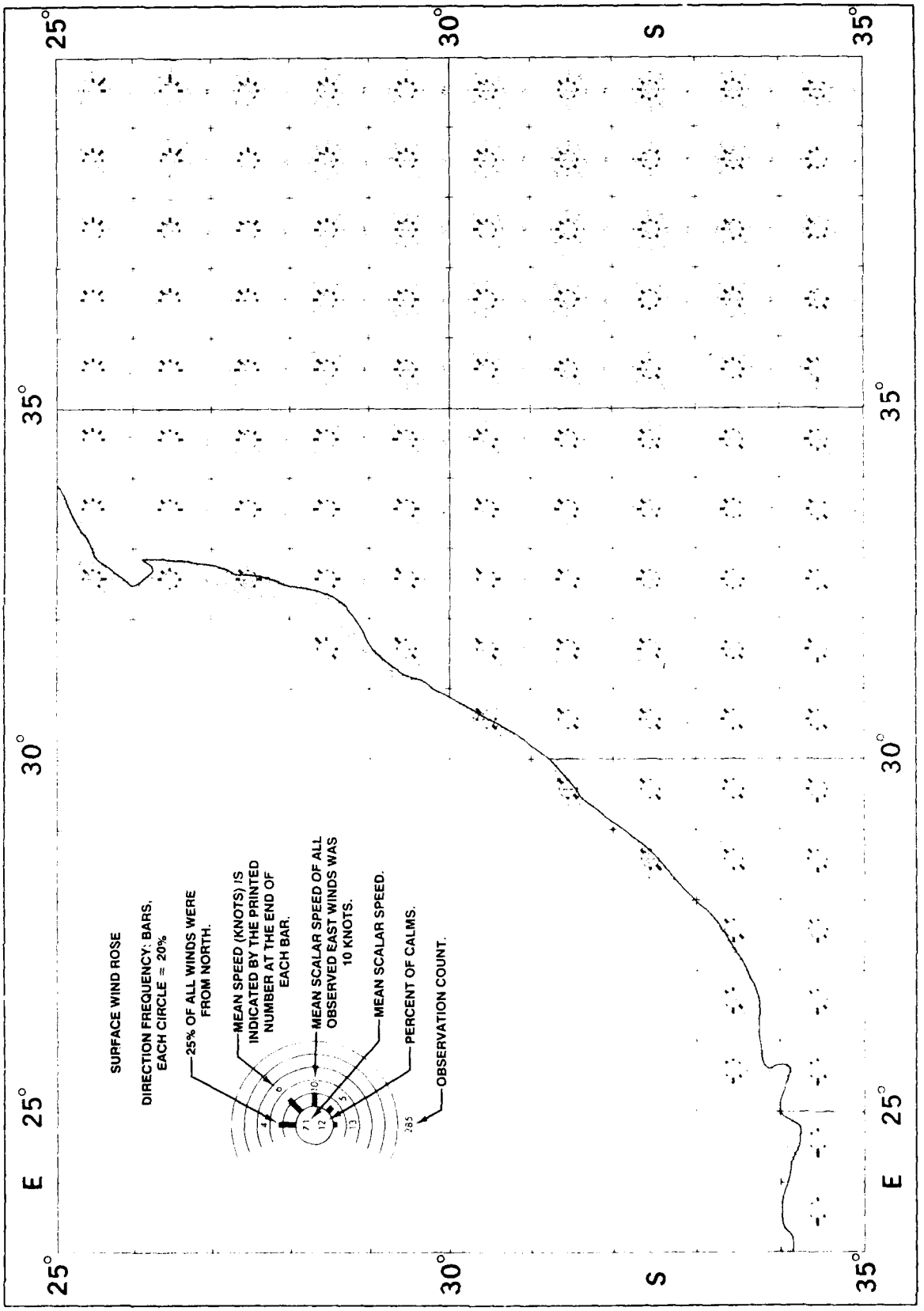
August

Surface Wind Roses



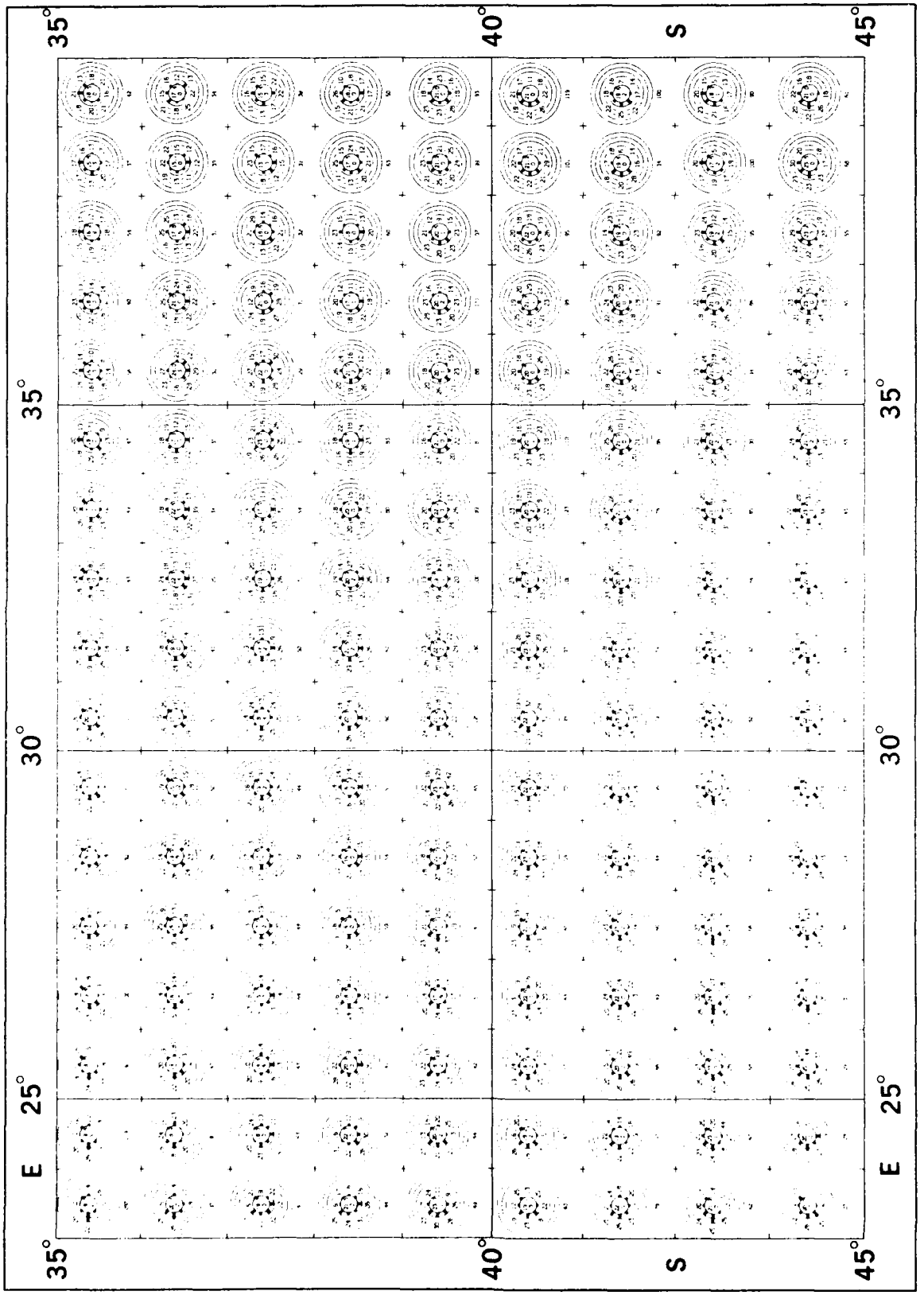
August

Surface Wind Roses

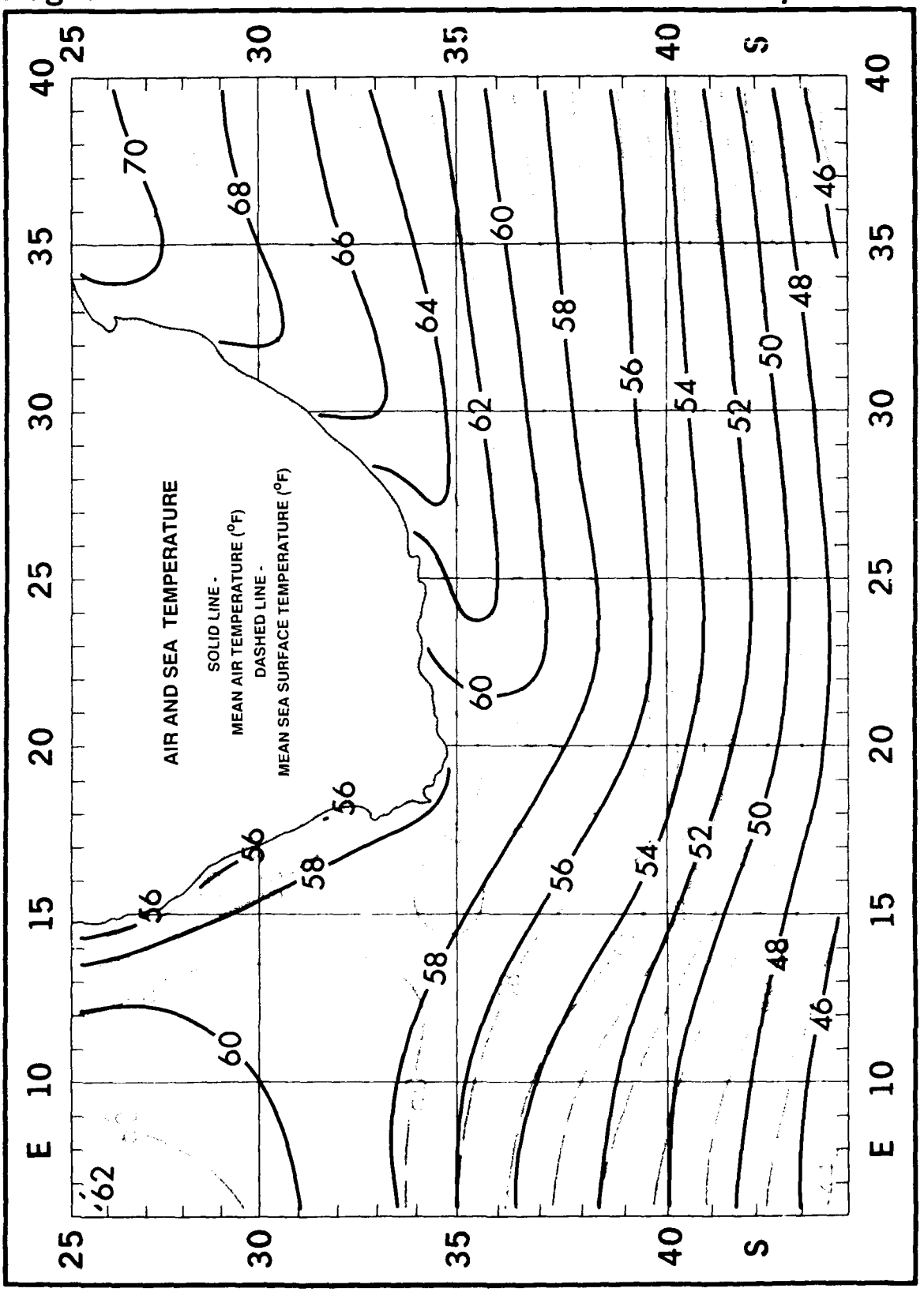


August

Surface Wind Roses

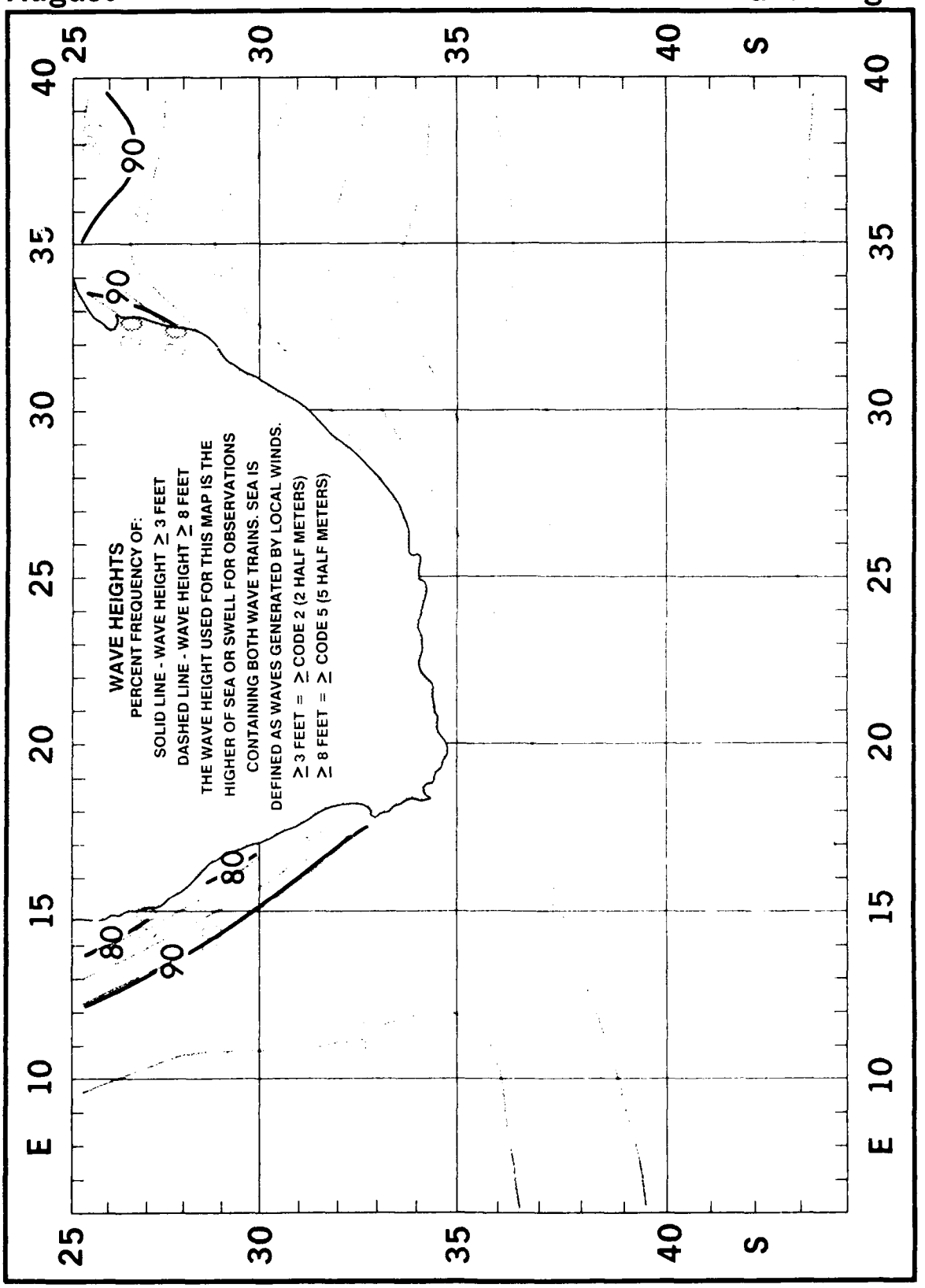


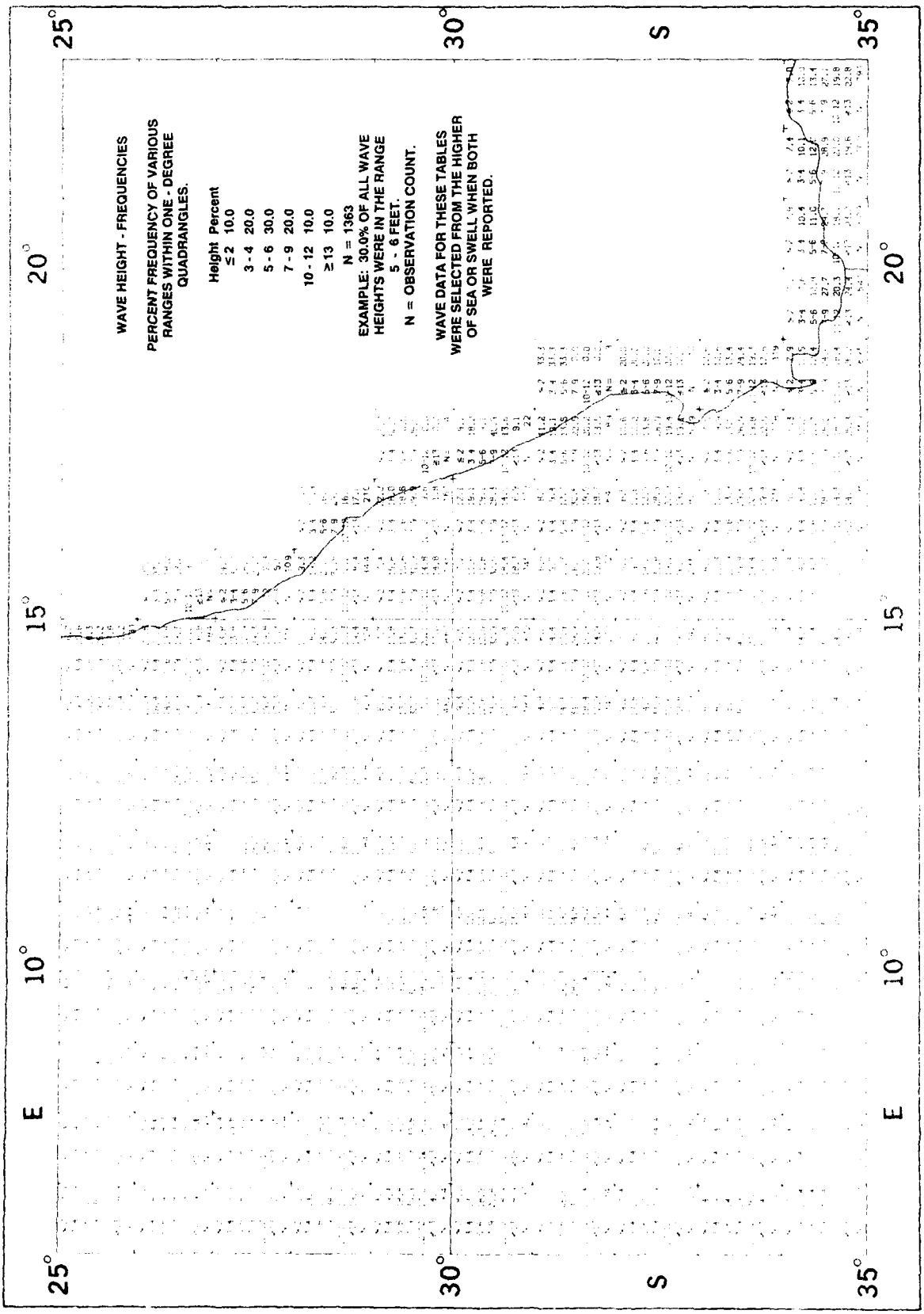
August **Air and Sea Temperature**



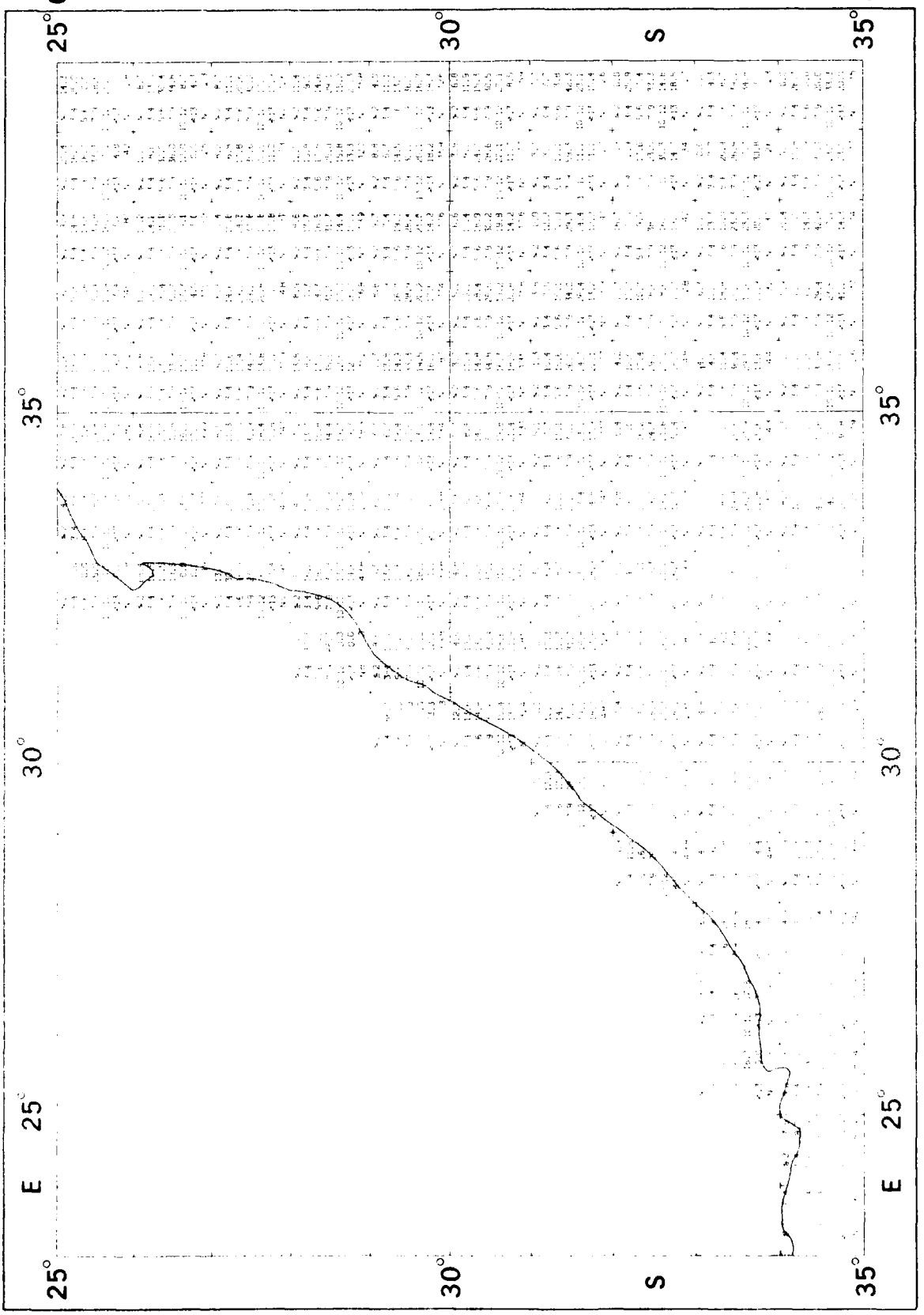
August

Wave Height



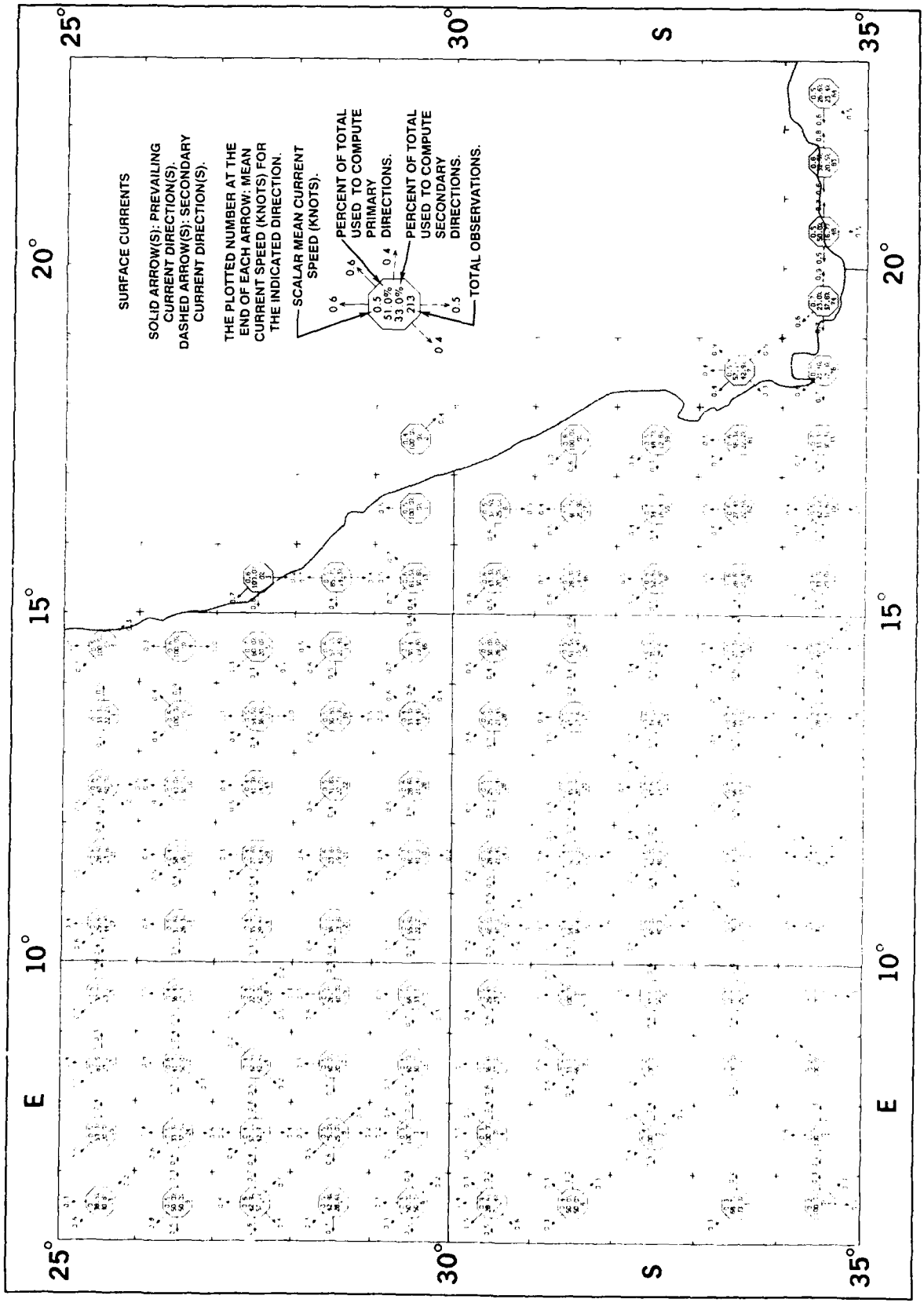

WAVE HEIGHT - FREQUENCIES
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE - DEGREE QUADRANGLES.
Height Percent
≤2 10.0
3 - 4 20.0
5 - 6 30.0
7 - 9 20.0
10 - 12 10.0
≥13 10.0
N = 1363
EXAMPLE: 30.0% OF ALL WAVE HEIGHTS WERE IN THE RANGE 5 - 6 FEET.
N = OBSERVATION COUNT.
WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.
25°
30°
35°
S
20°
15°
10°
E

August **Wave Height**



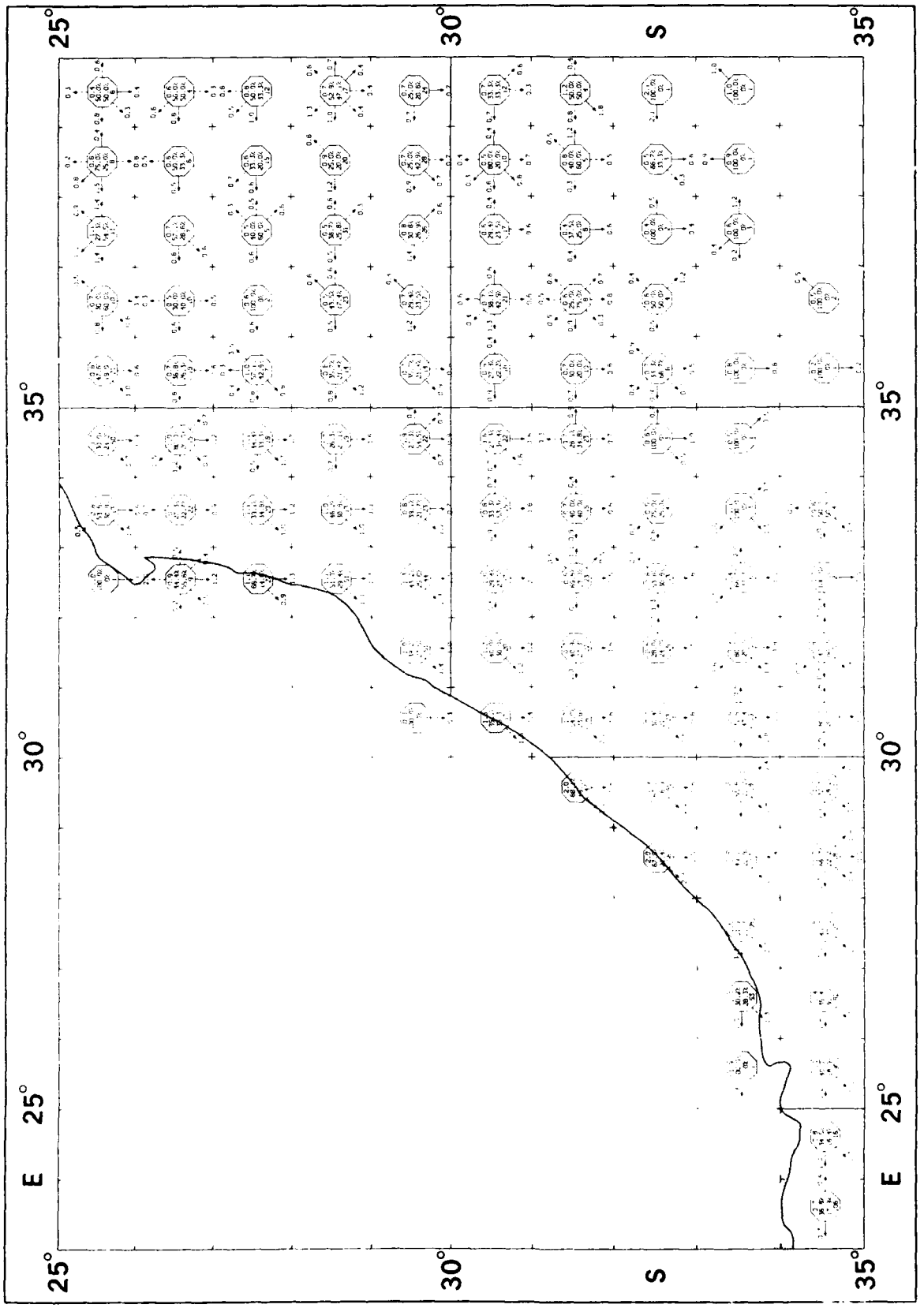
August

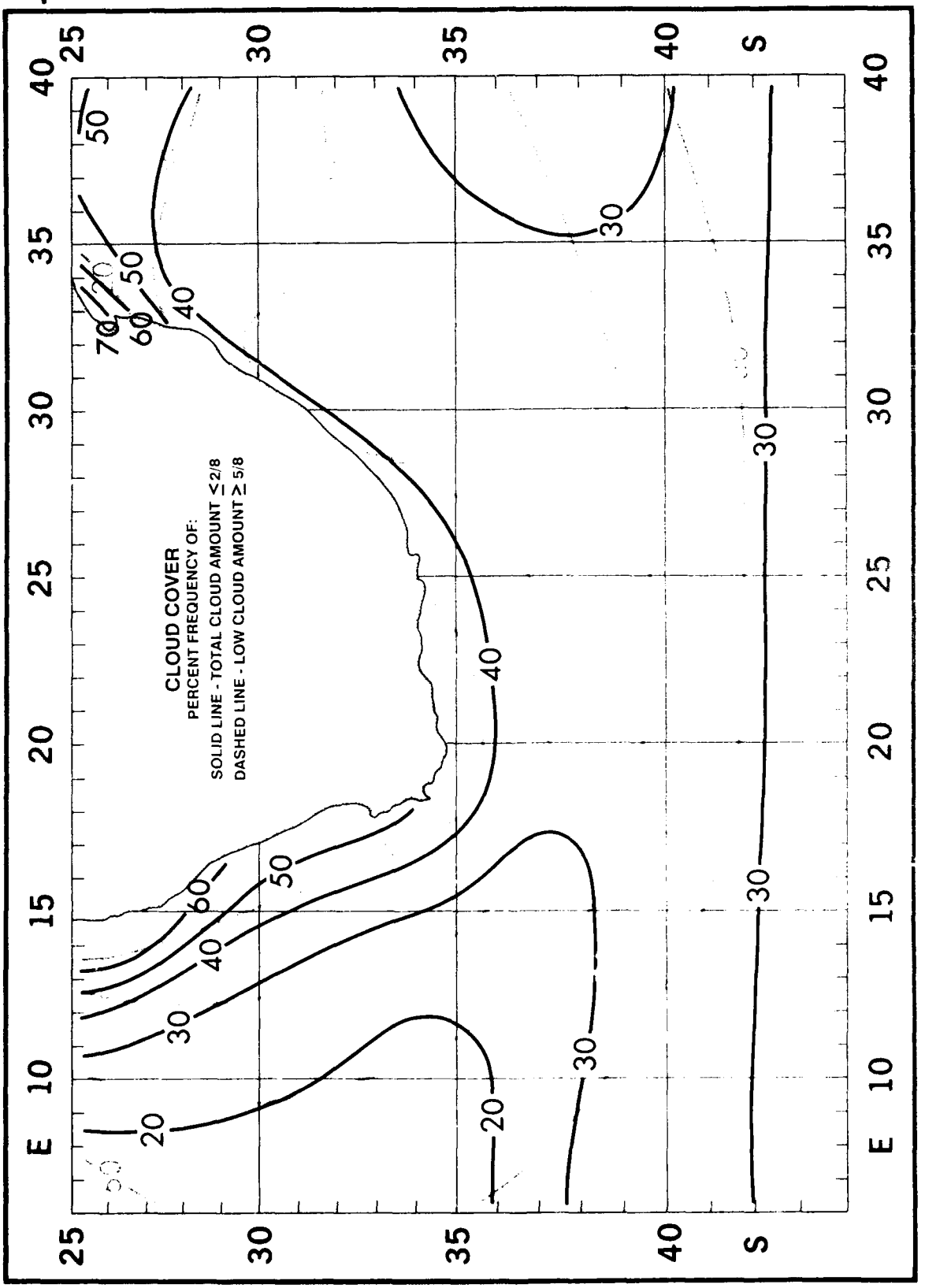
Surface Currents



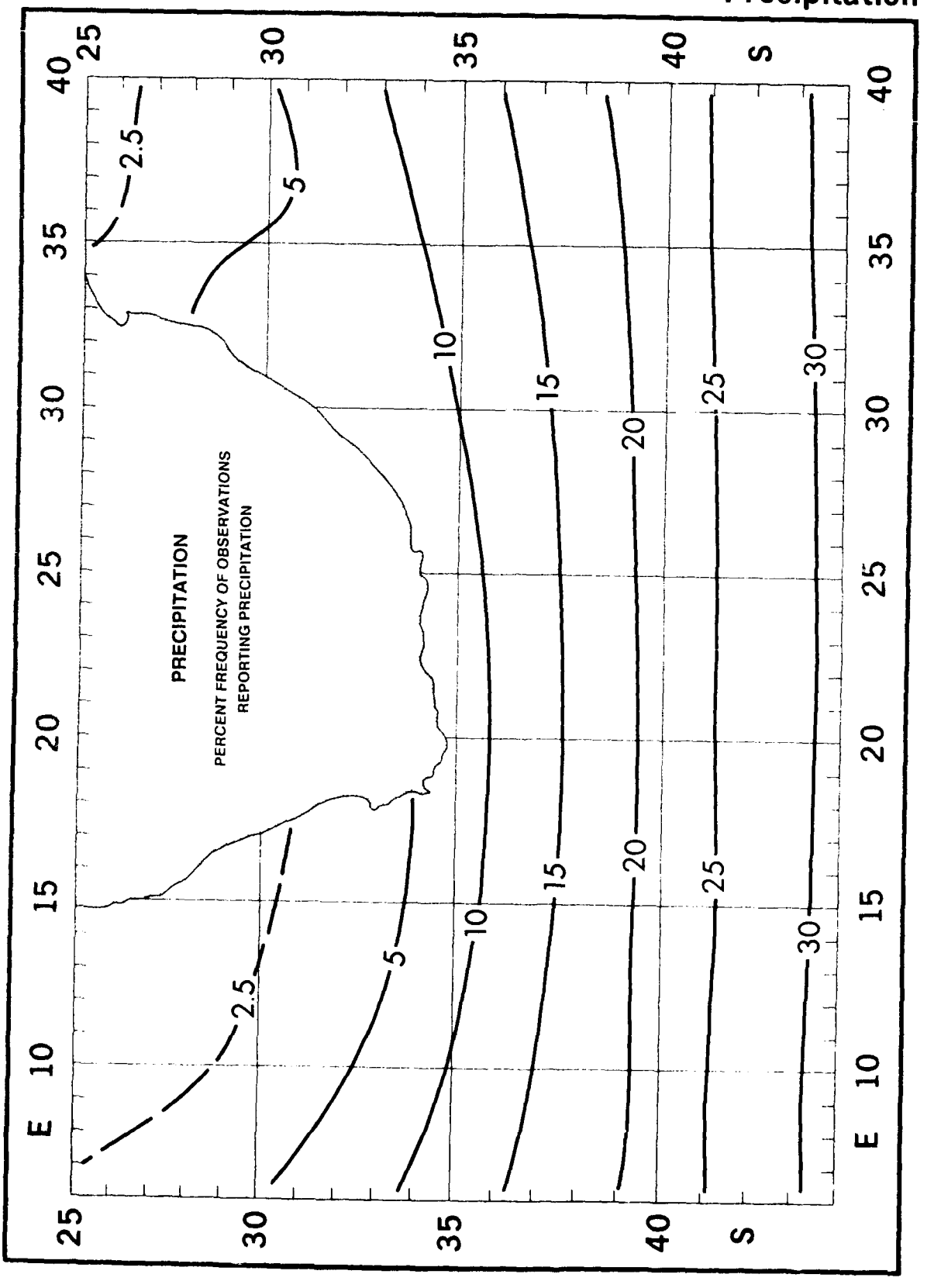
August

Surface Currents

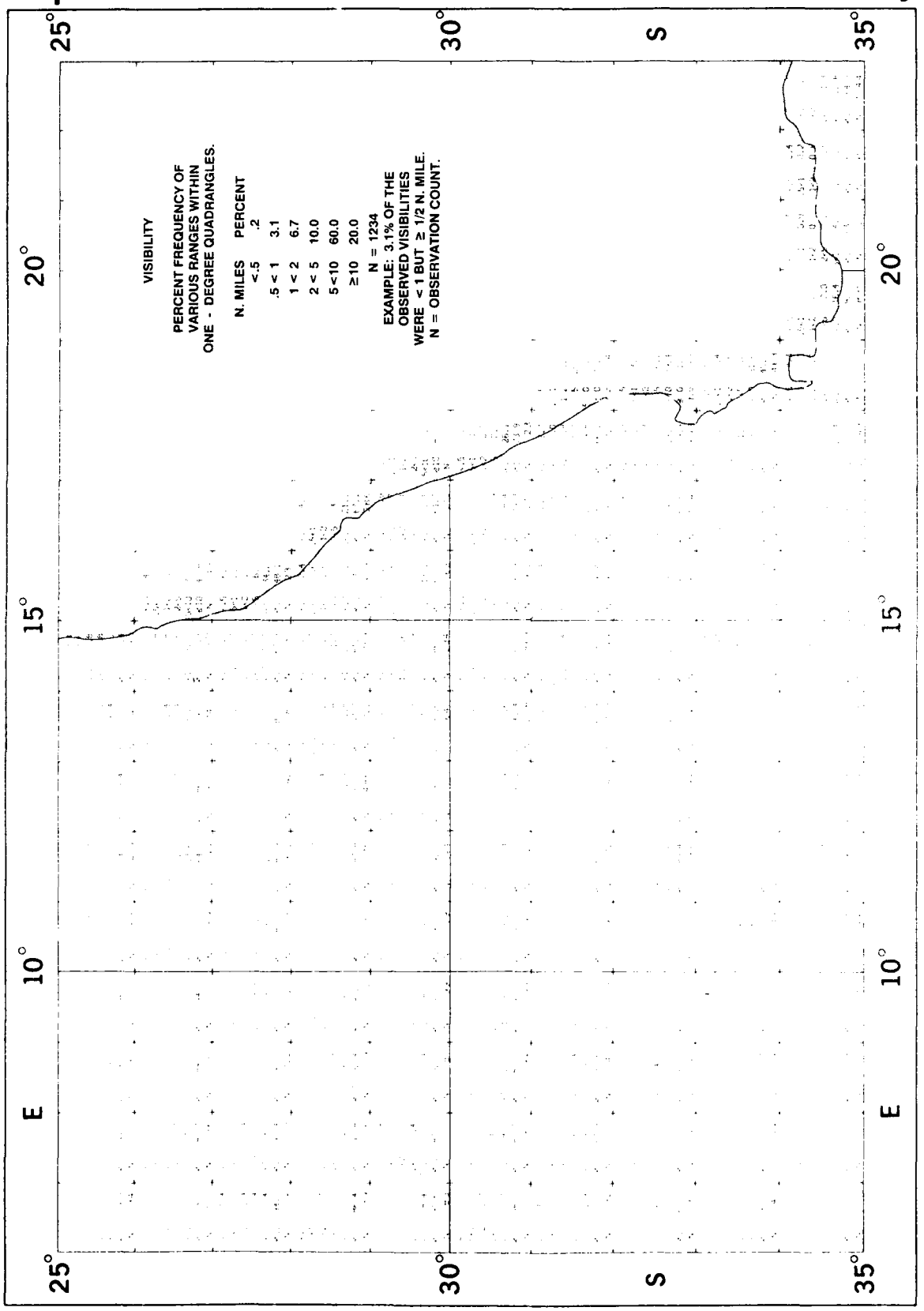



CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE - TOTAL CLOUD AMOUNT ≤ 2/8
DASHED LINE - LOW CLOUD AMOUNT ≥ 5/8
25
30
35
40
S
E
10
15
20
50
60
70
40
30
20

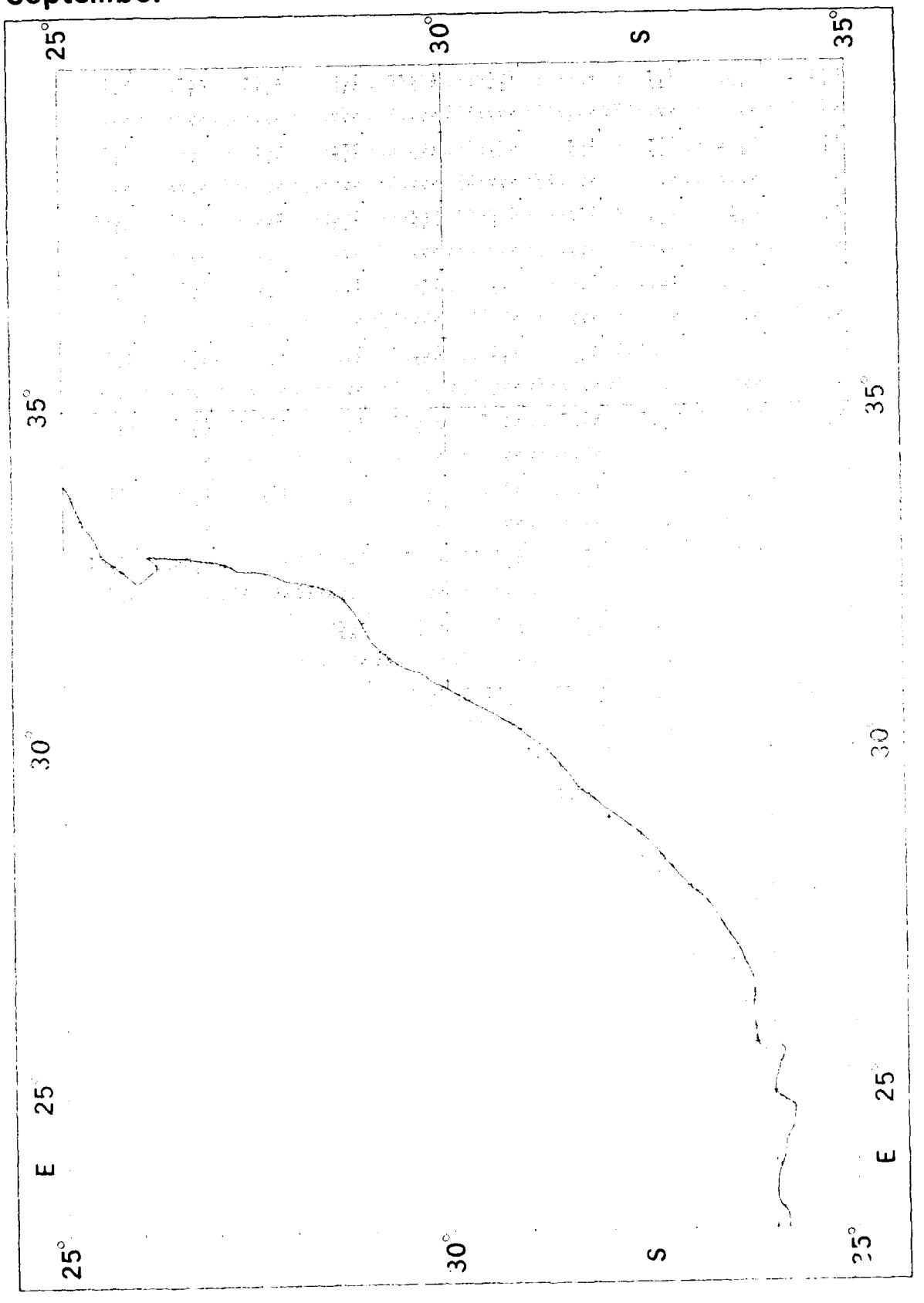
September **Precipitation**



September Visibility

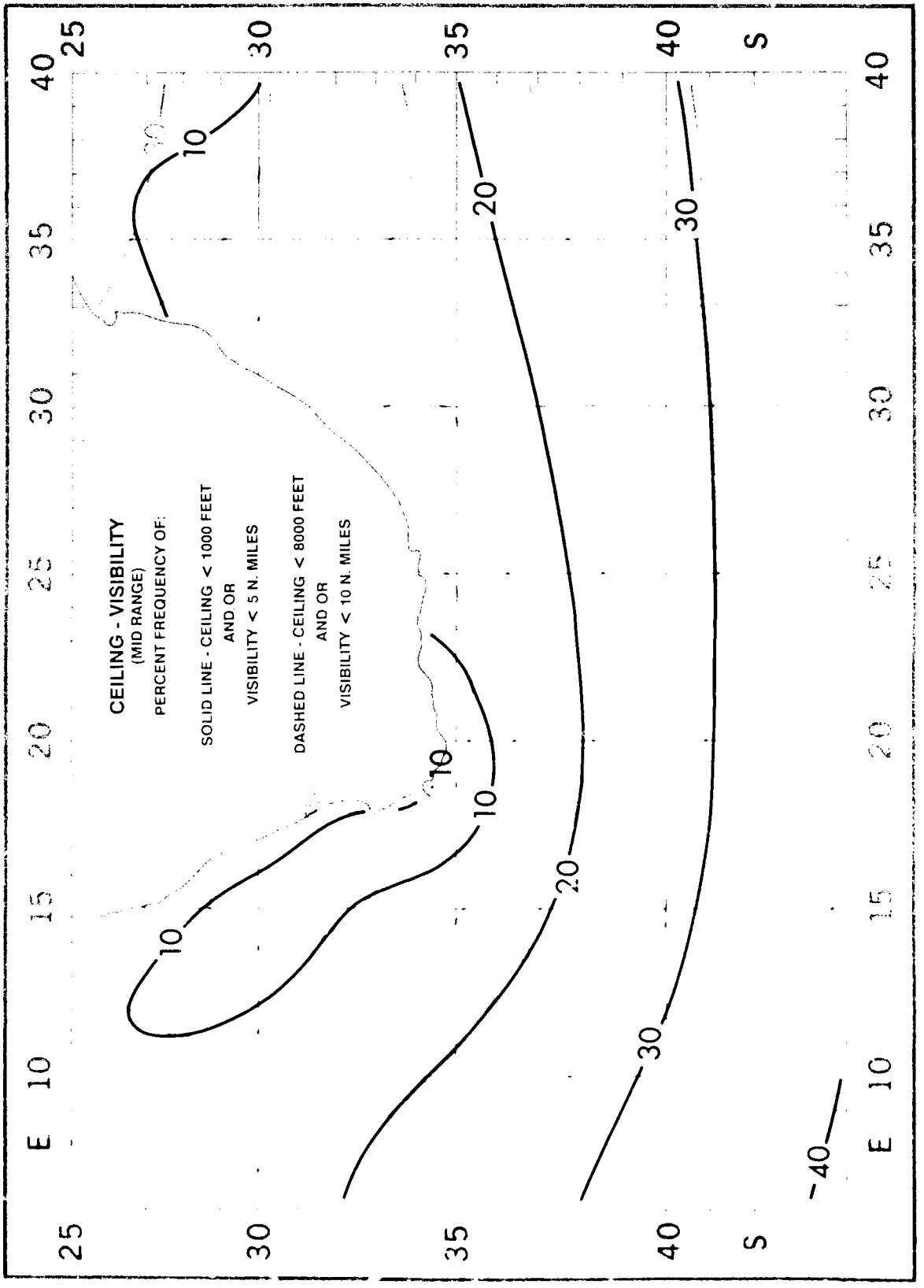


September **Visibility**



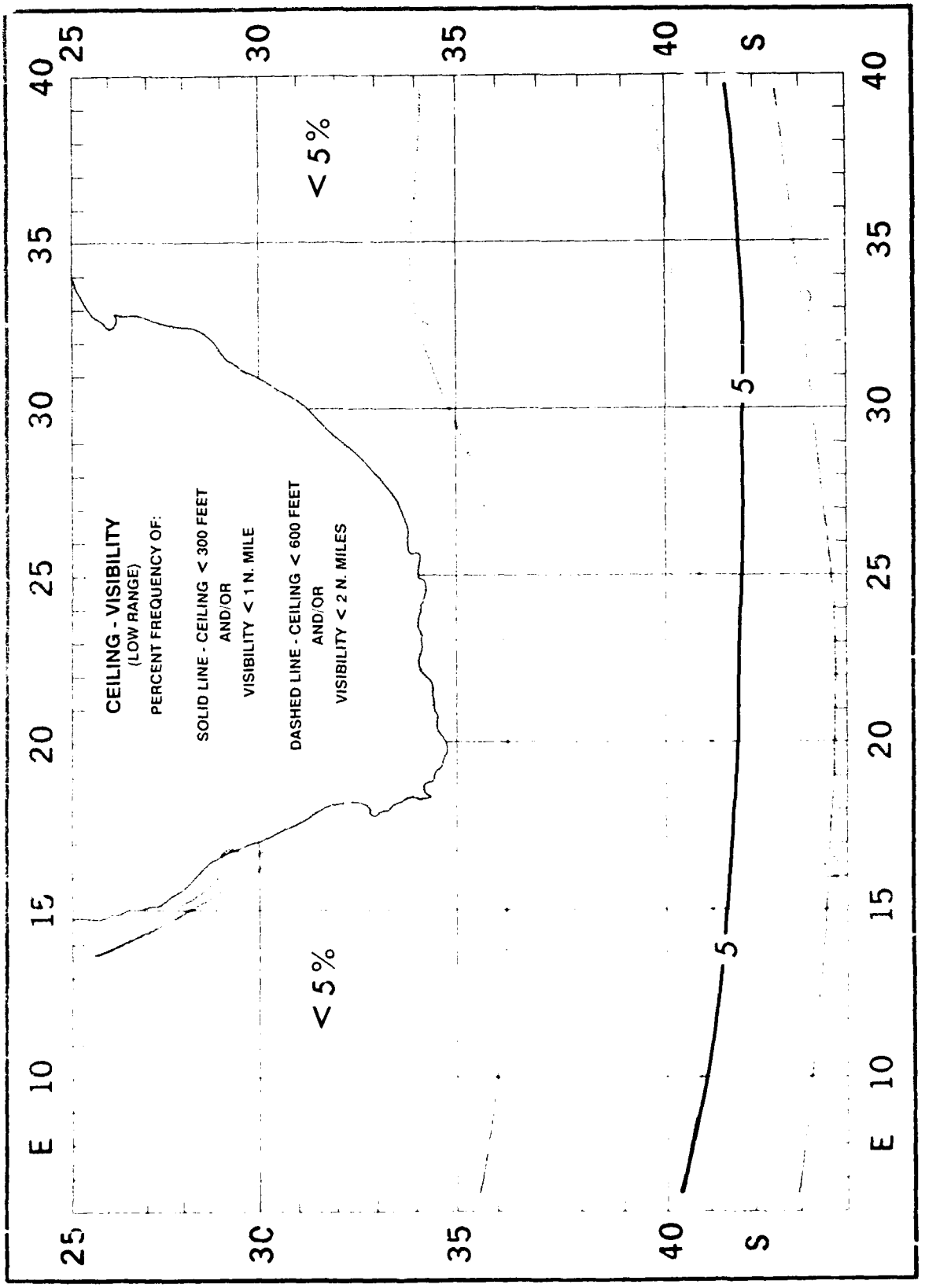
September

Ceiling - Visibility (Mid Range)

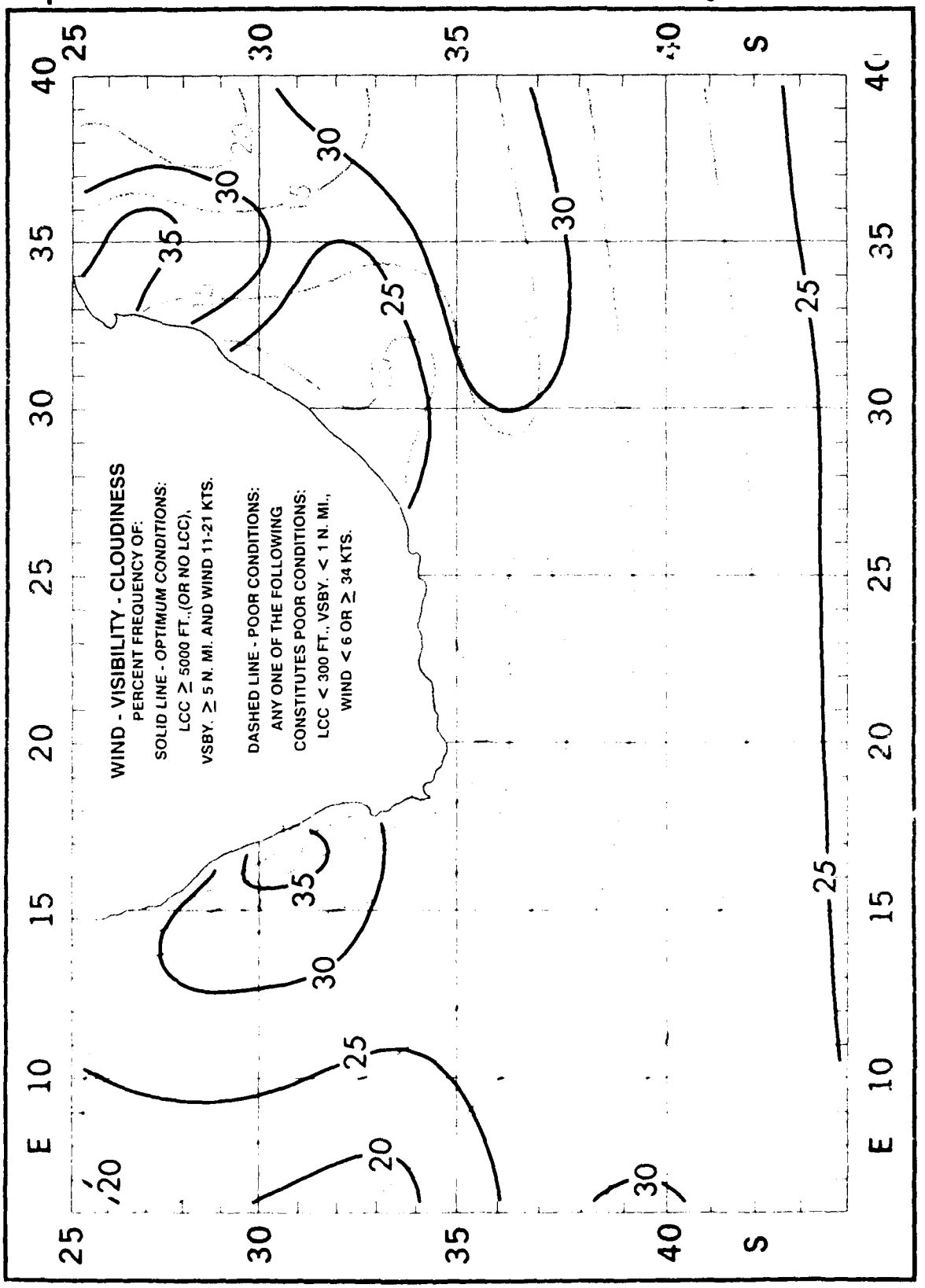


September

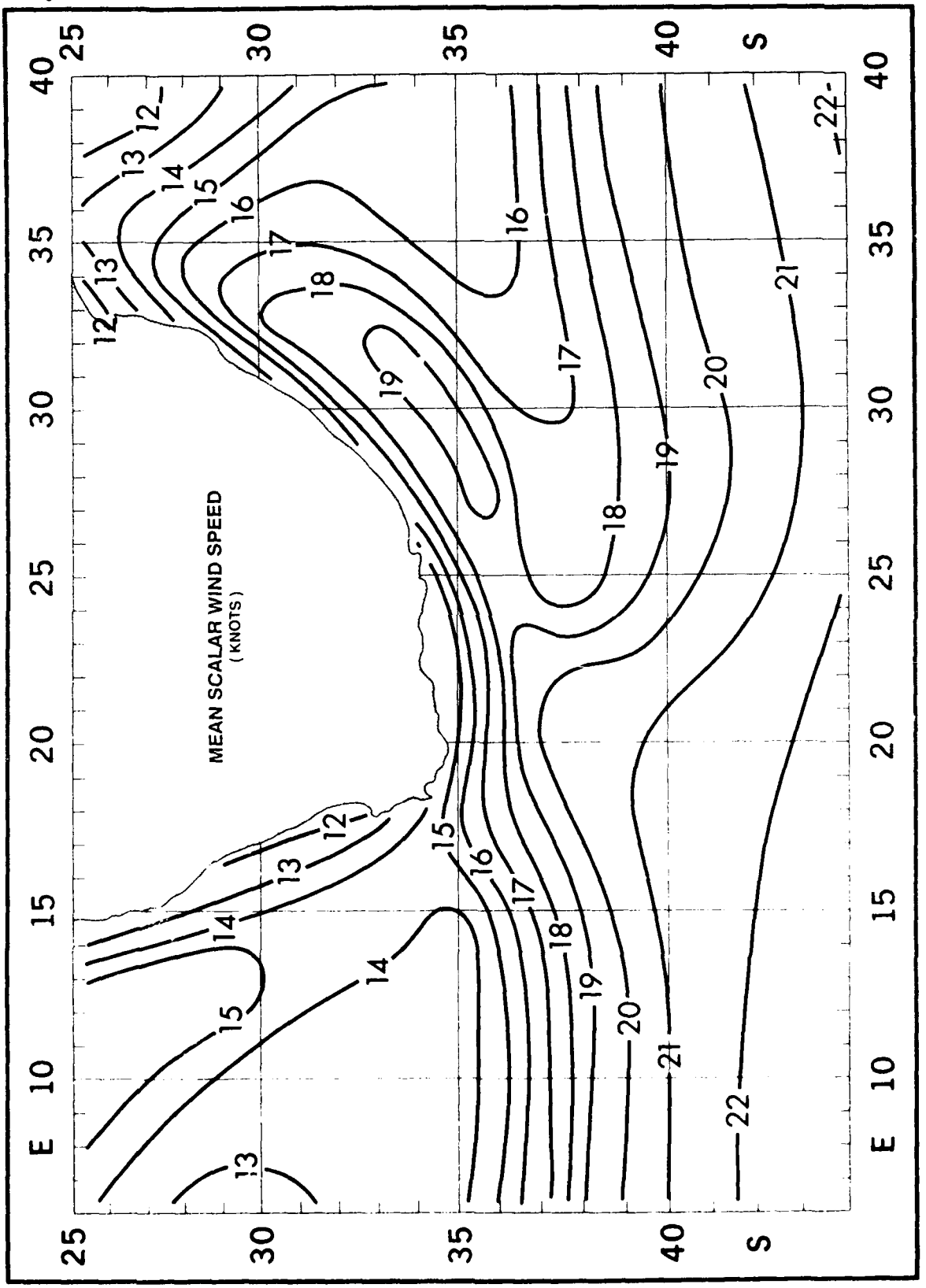
Ceiling - Visibility (Low Range)



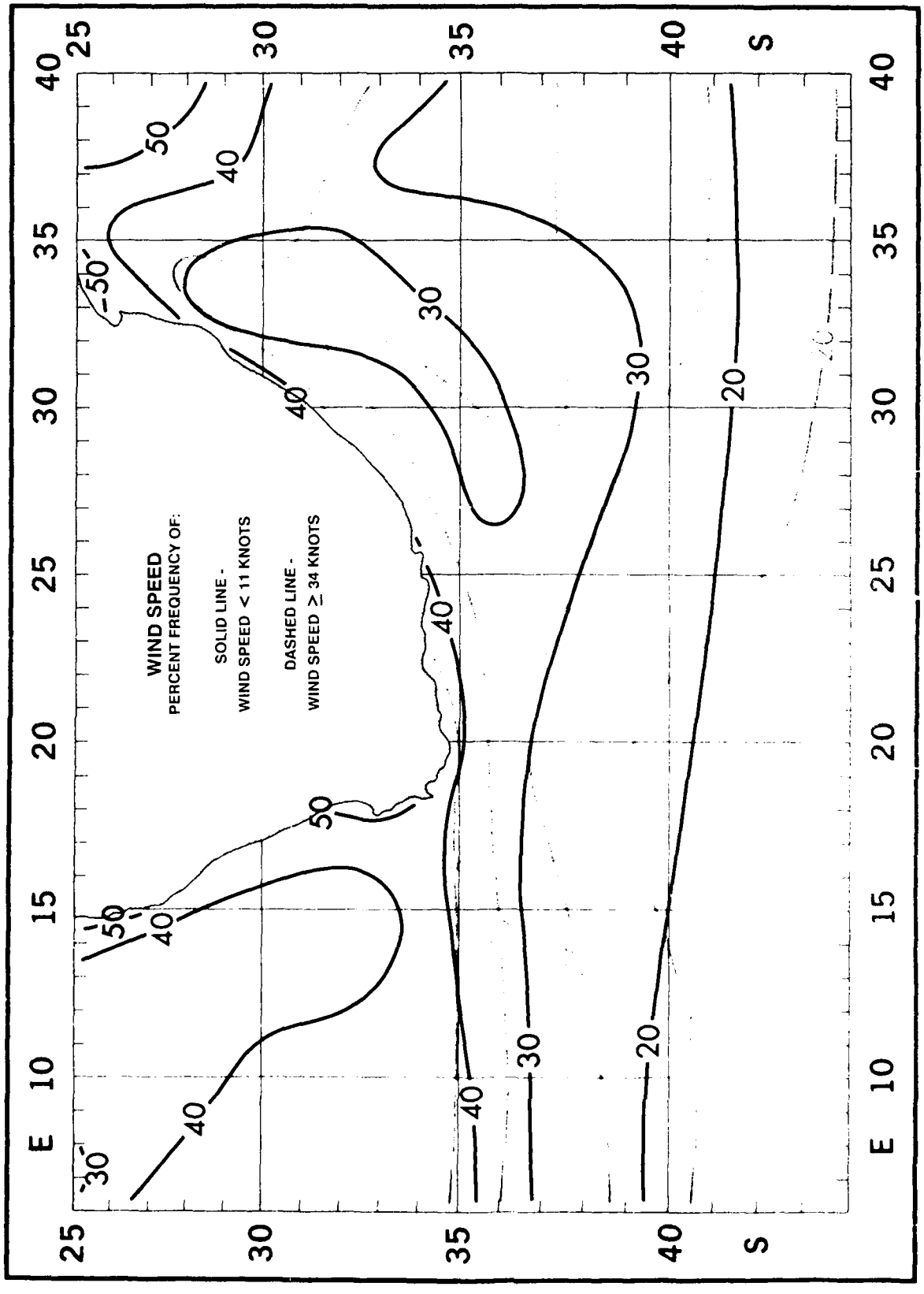
September **Wind - Visibility - Cloudiness**



September **Mean Scalar Wind Speed**

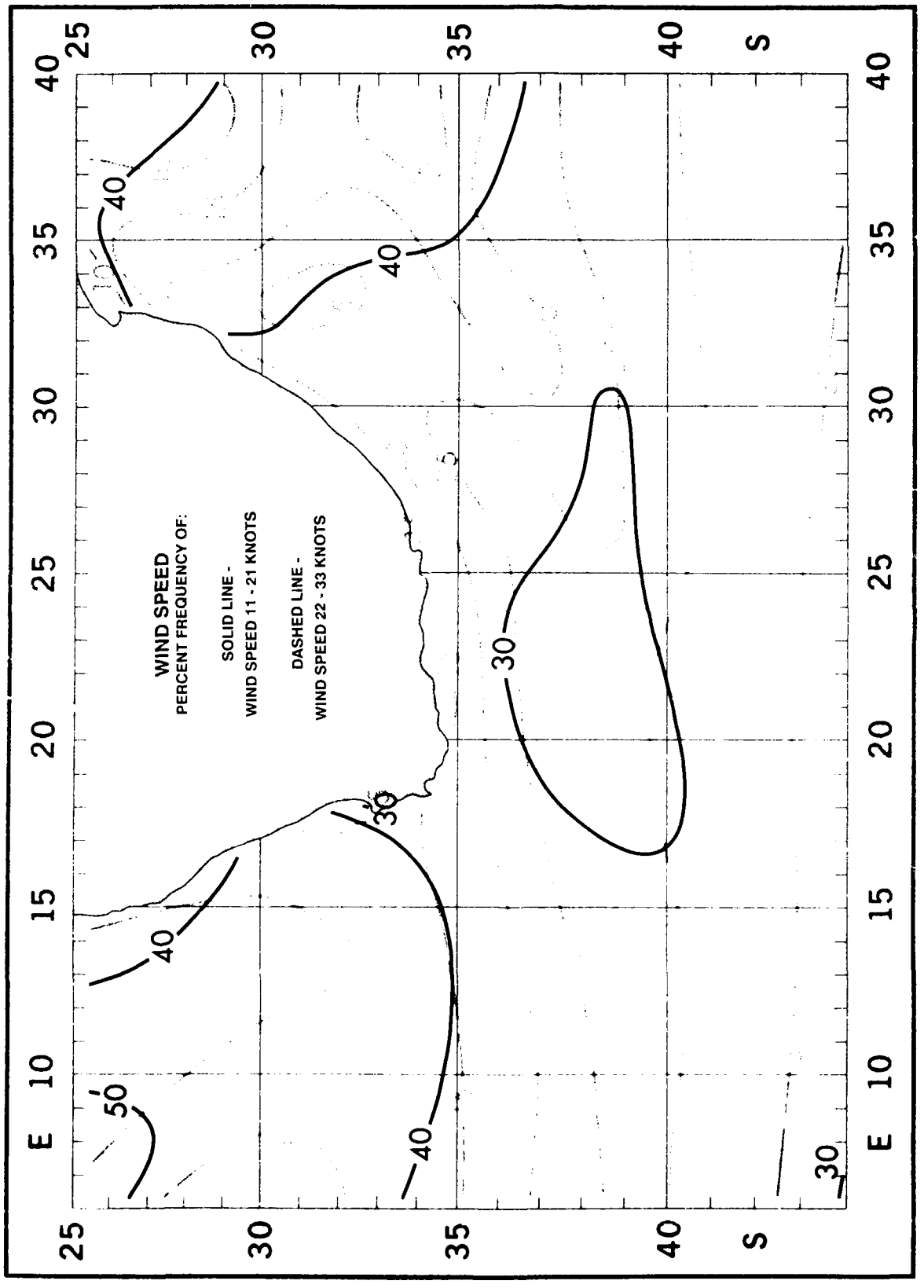


September **Wind Speed ≤11 and ≥34 Knots**



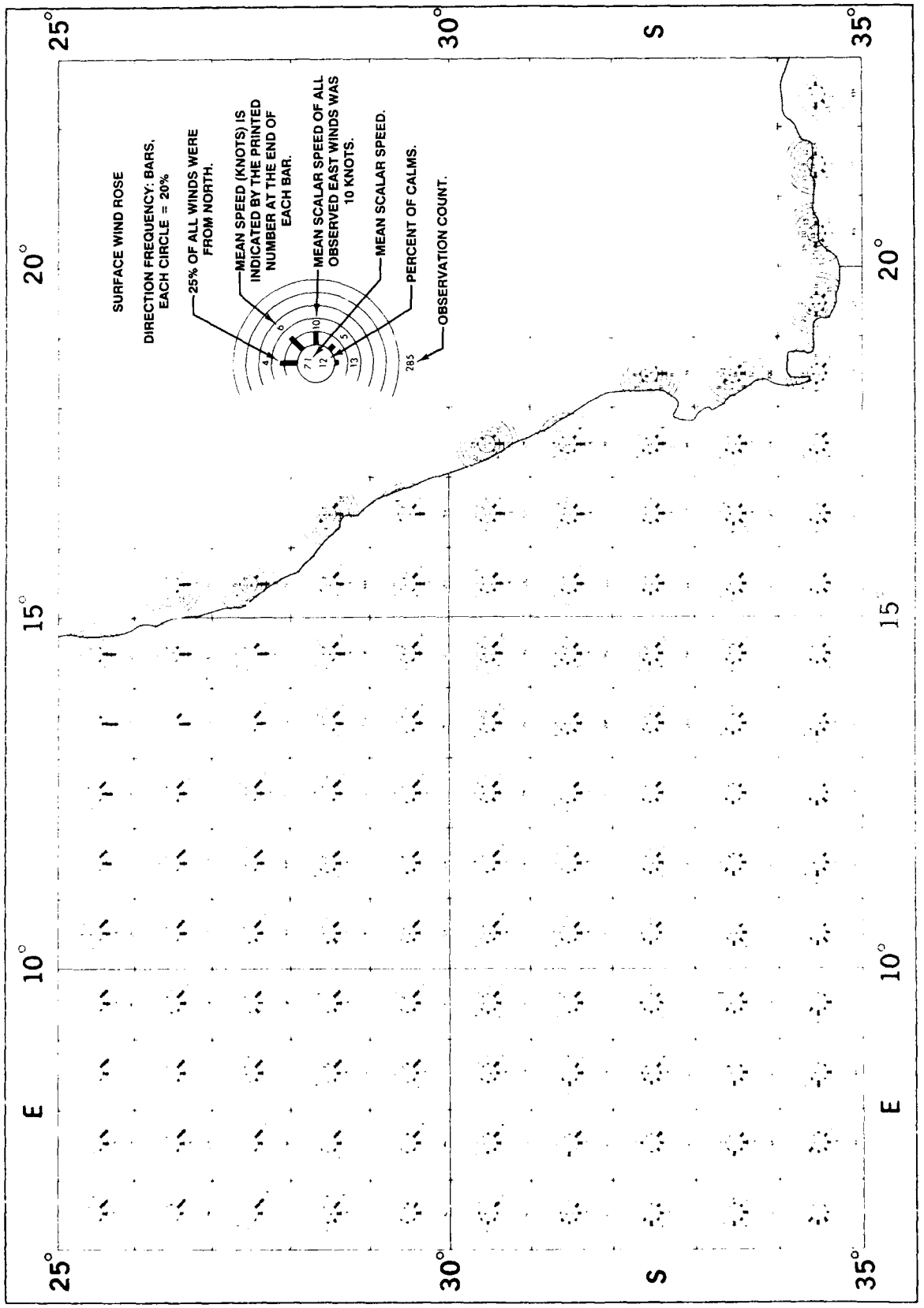
September

Wind Speed 11 - 21 and 22 - 33 Knots



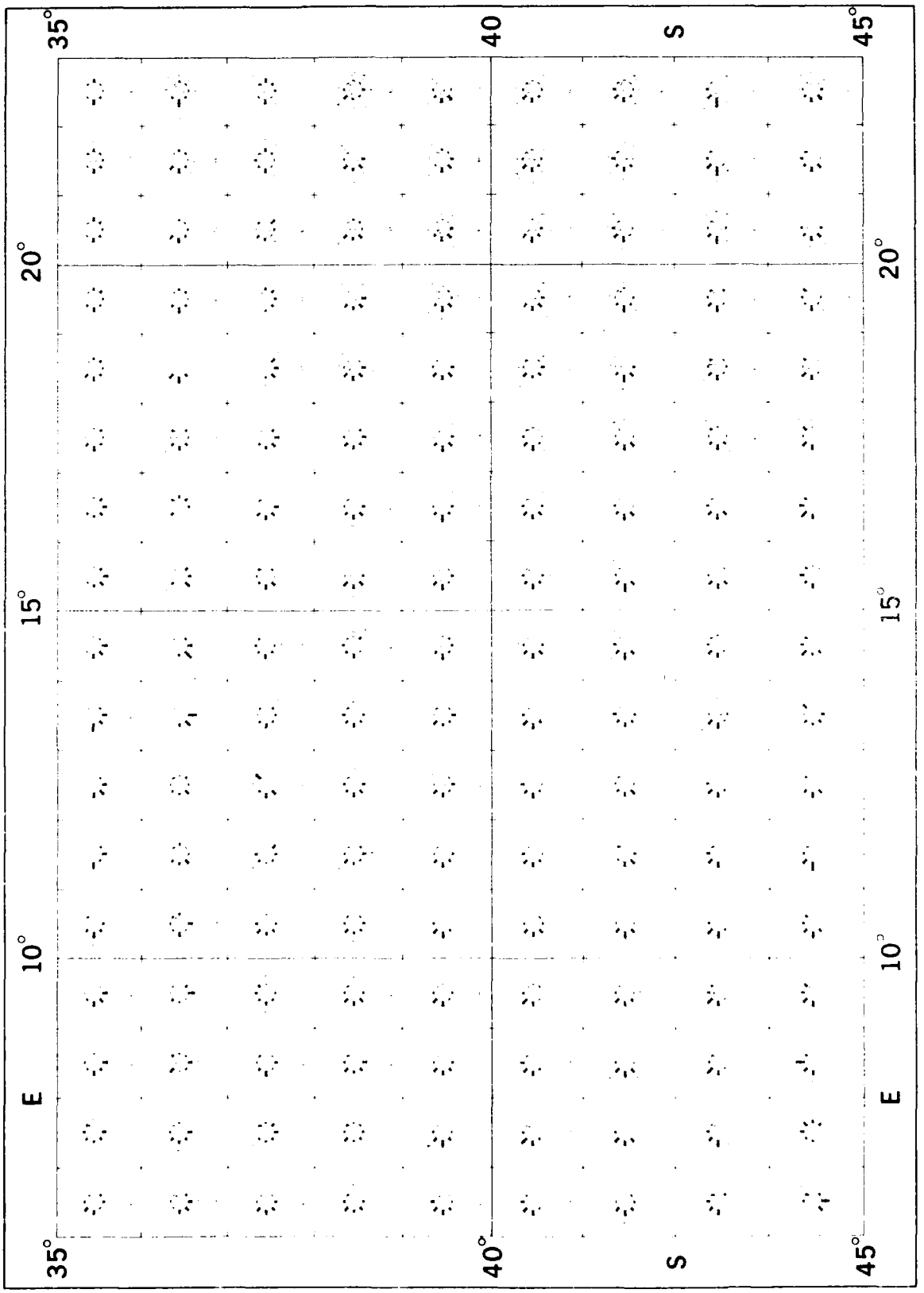
September

Surface Wind Roses



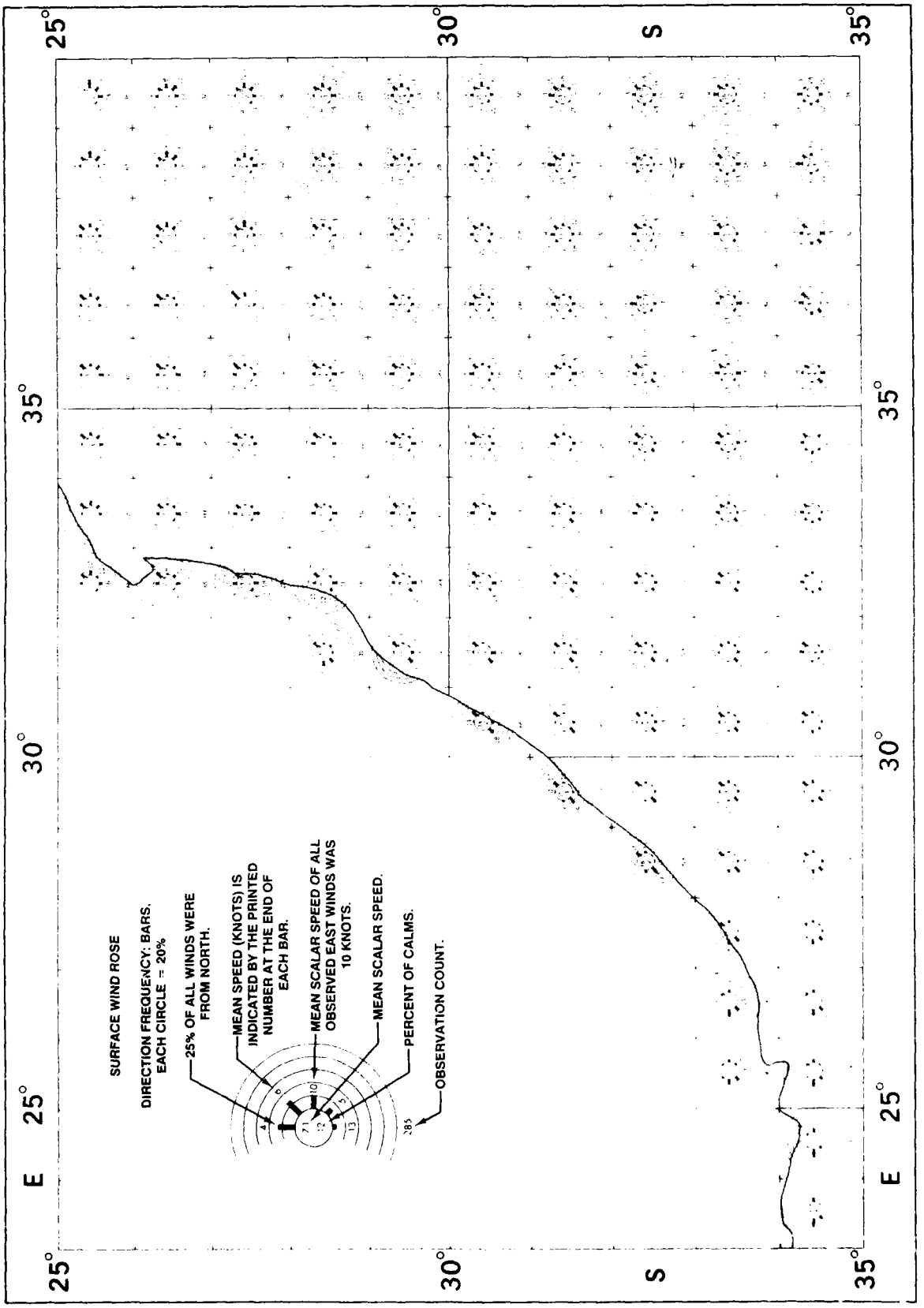
September

Surface Wind Roses



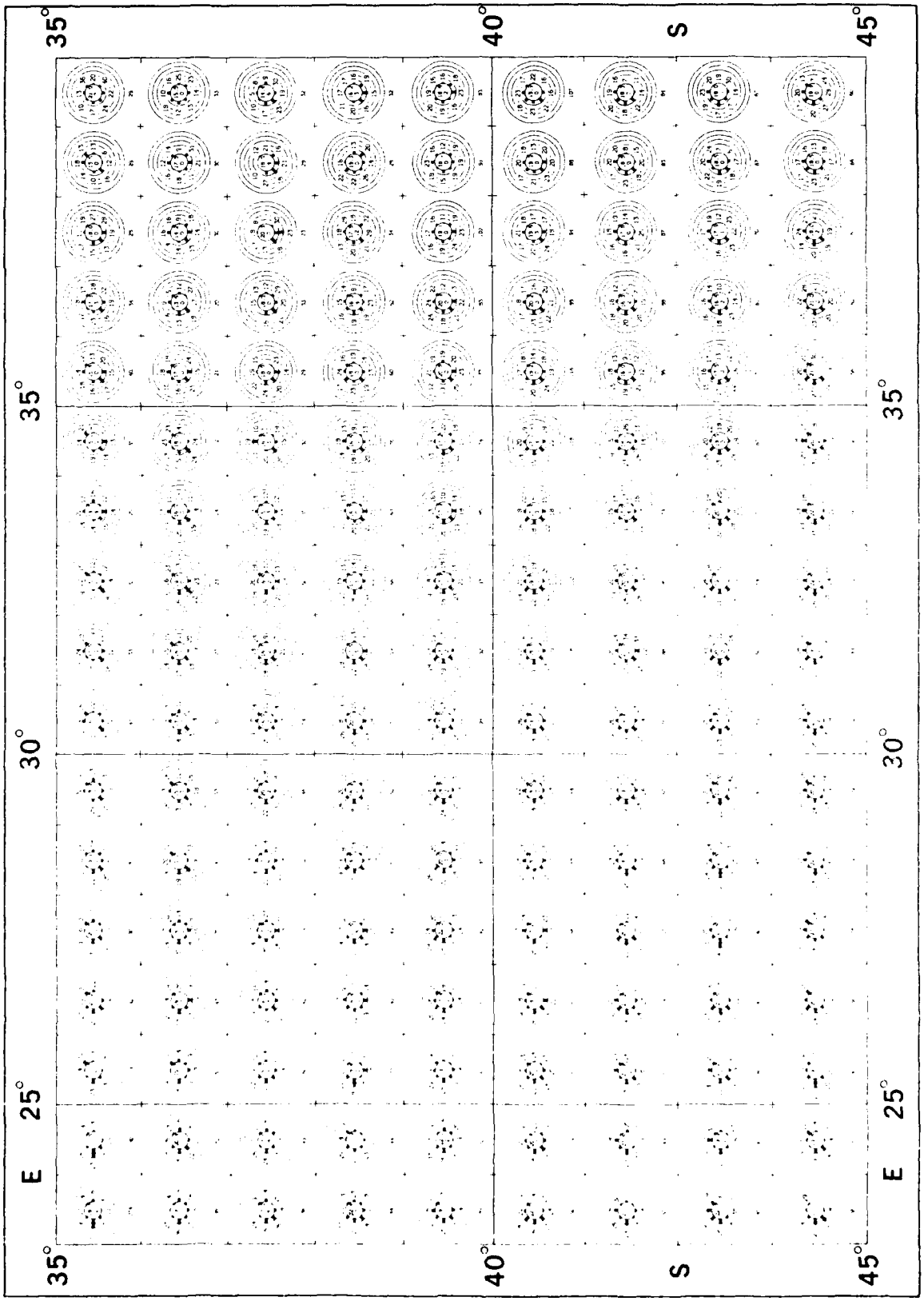
September

Surface Wind Roses

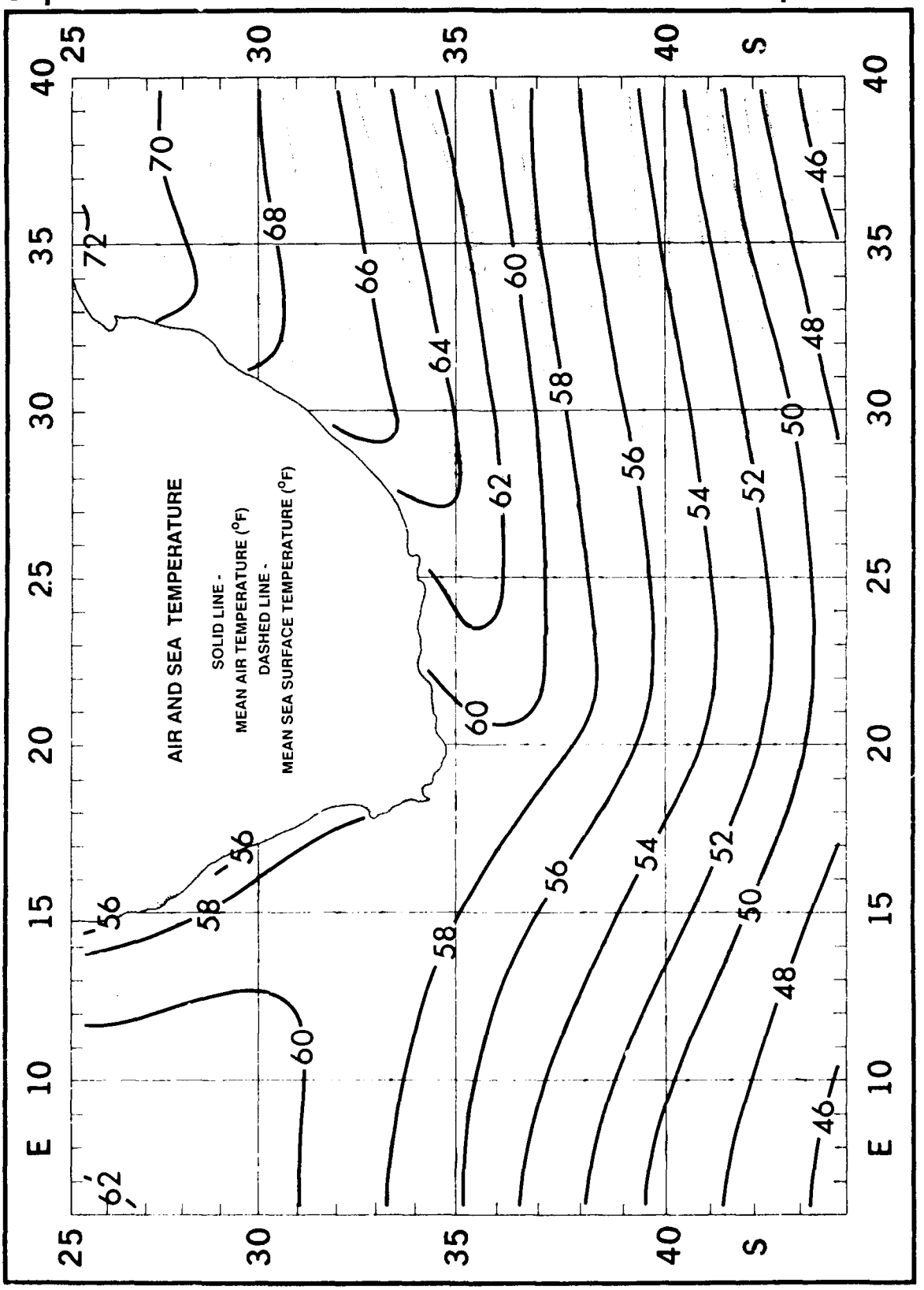


September

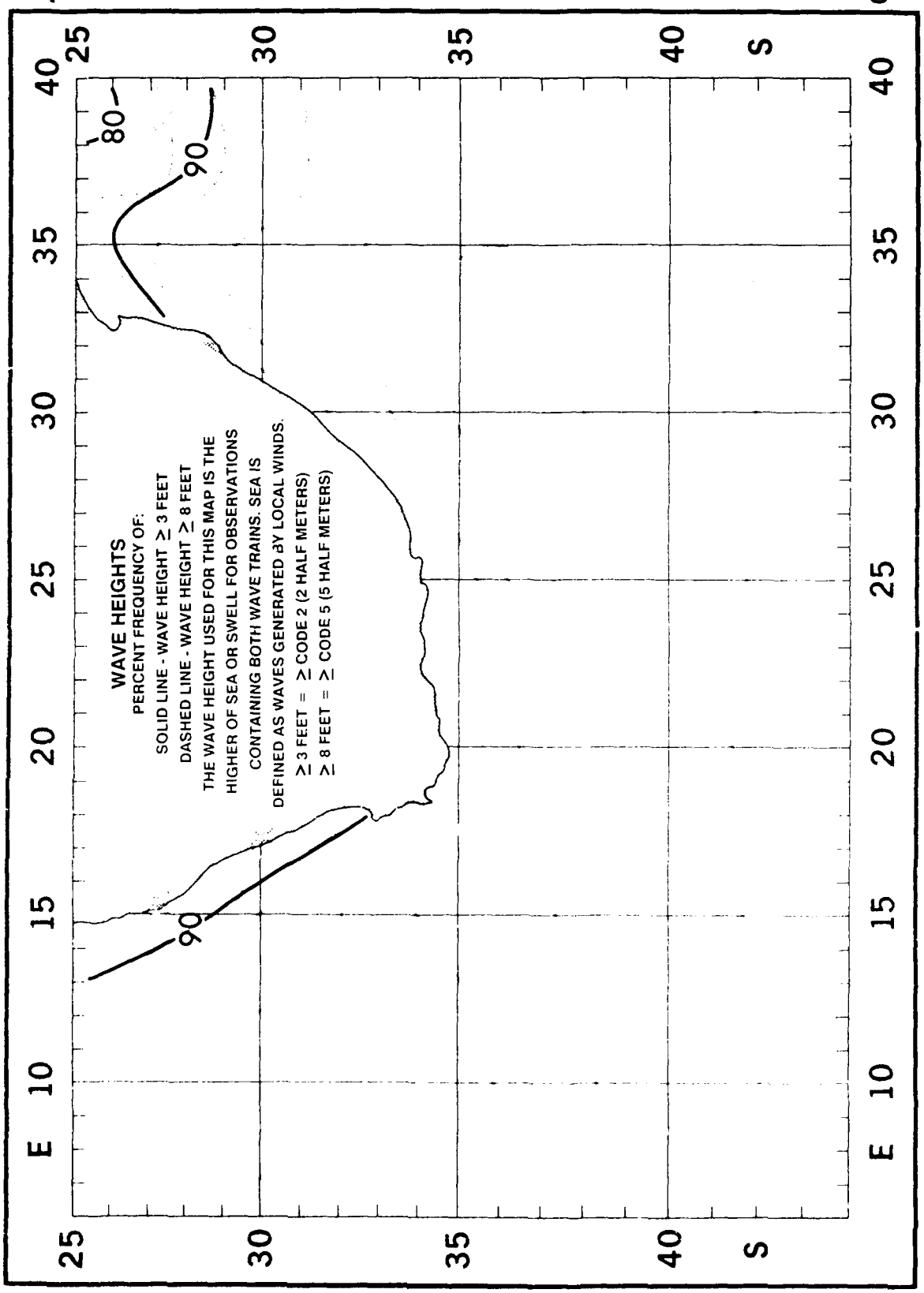
Surface Wind Roses



September **Air and Sea Temperature**

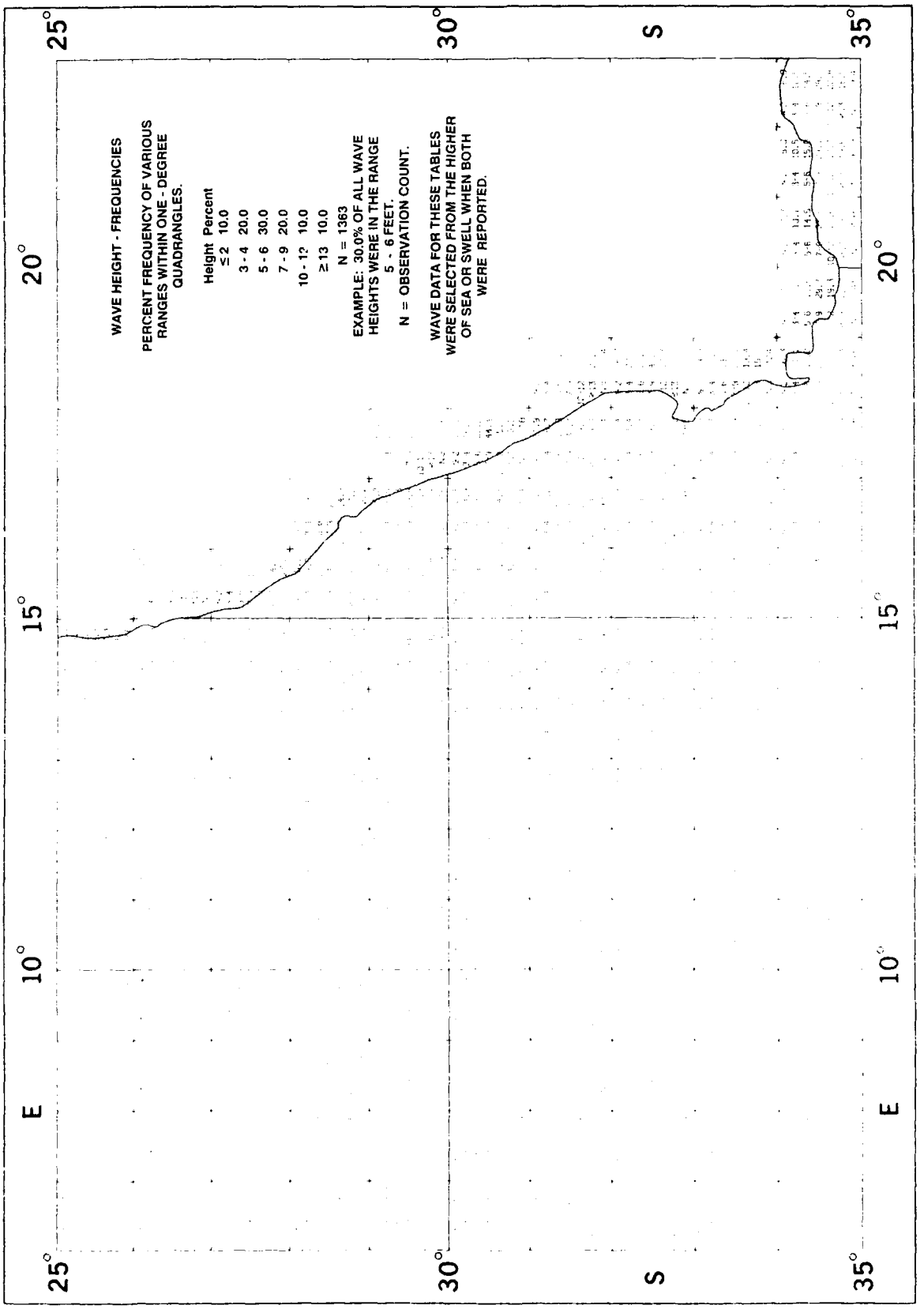


September **Wave Height**

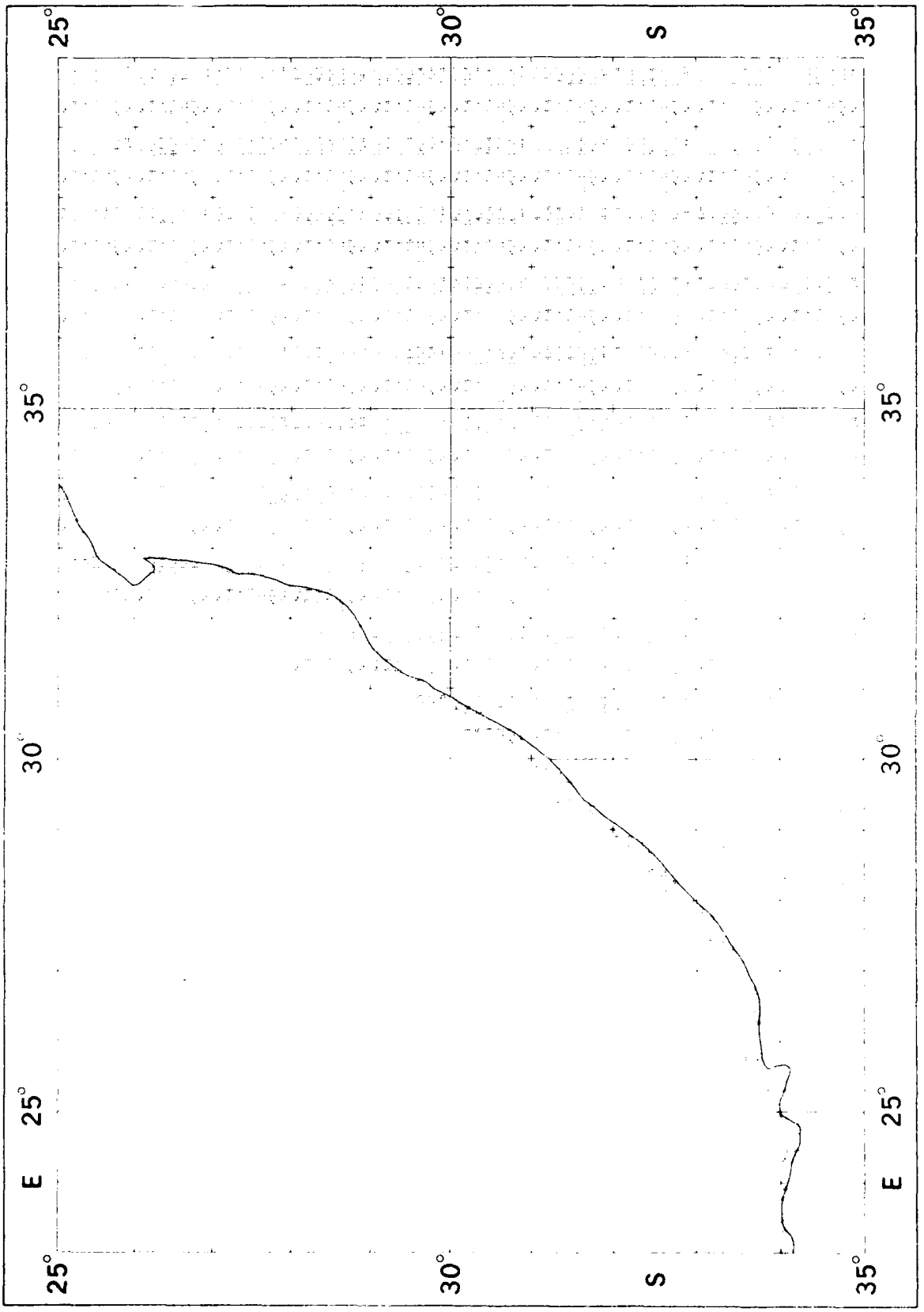


September

Wave Height

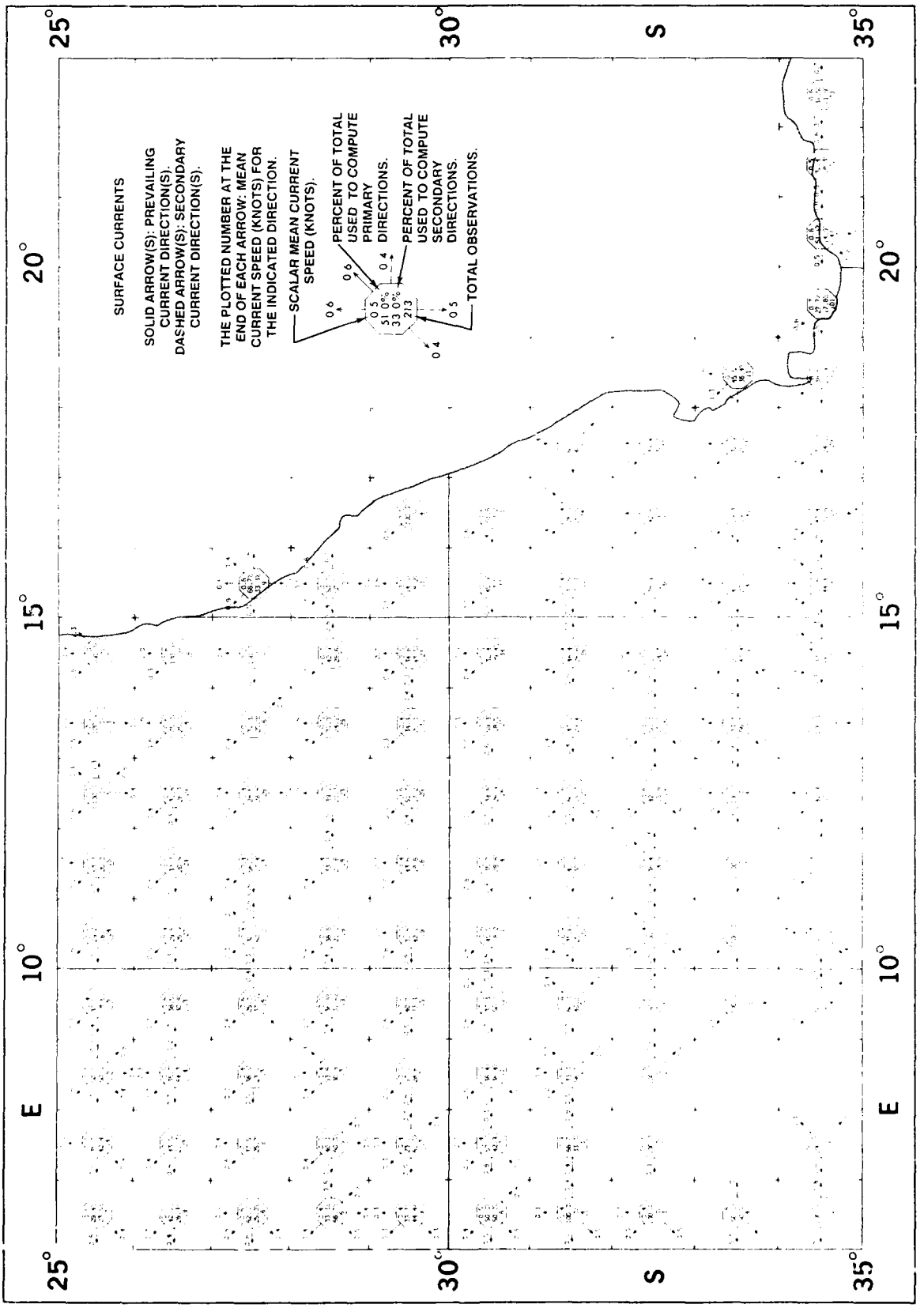


September **Wave Height**

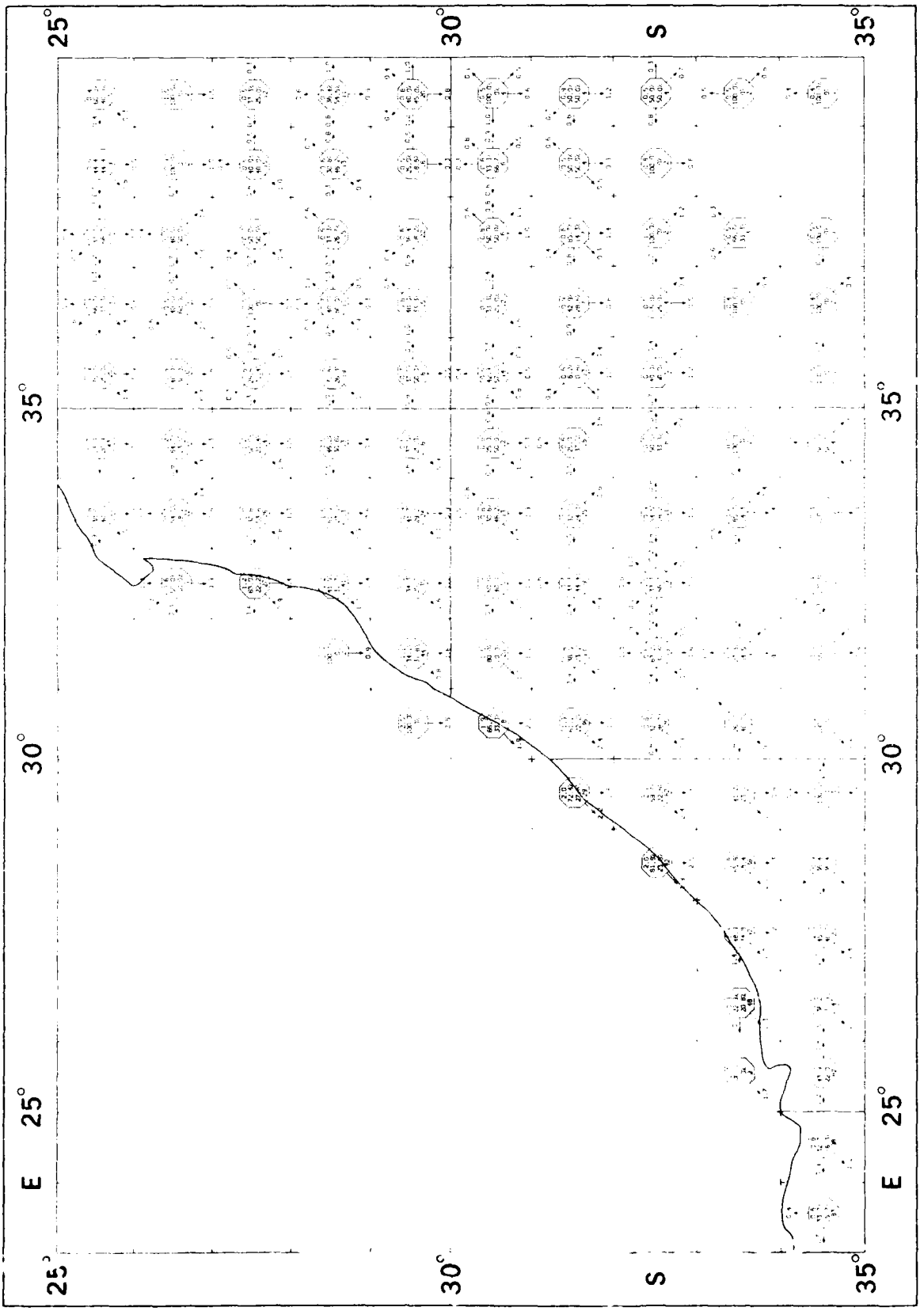


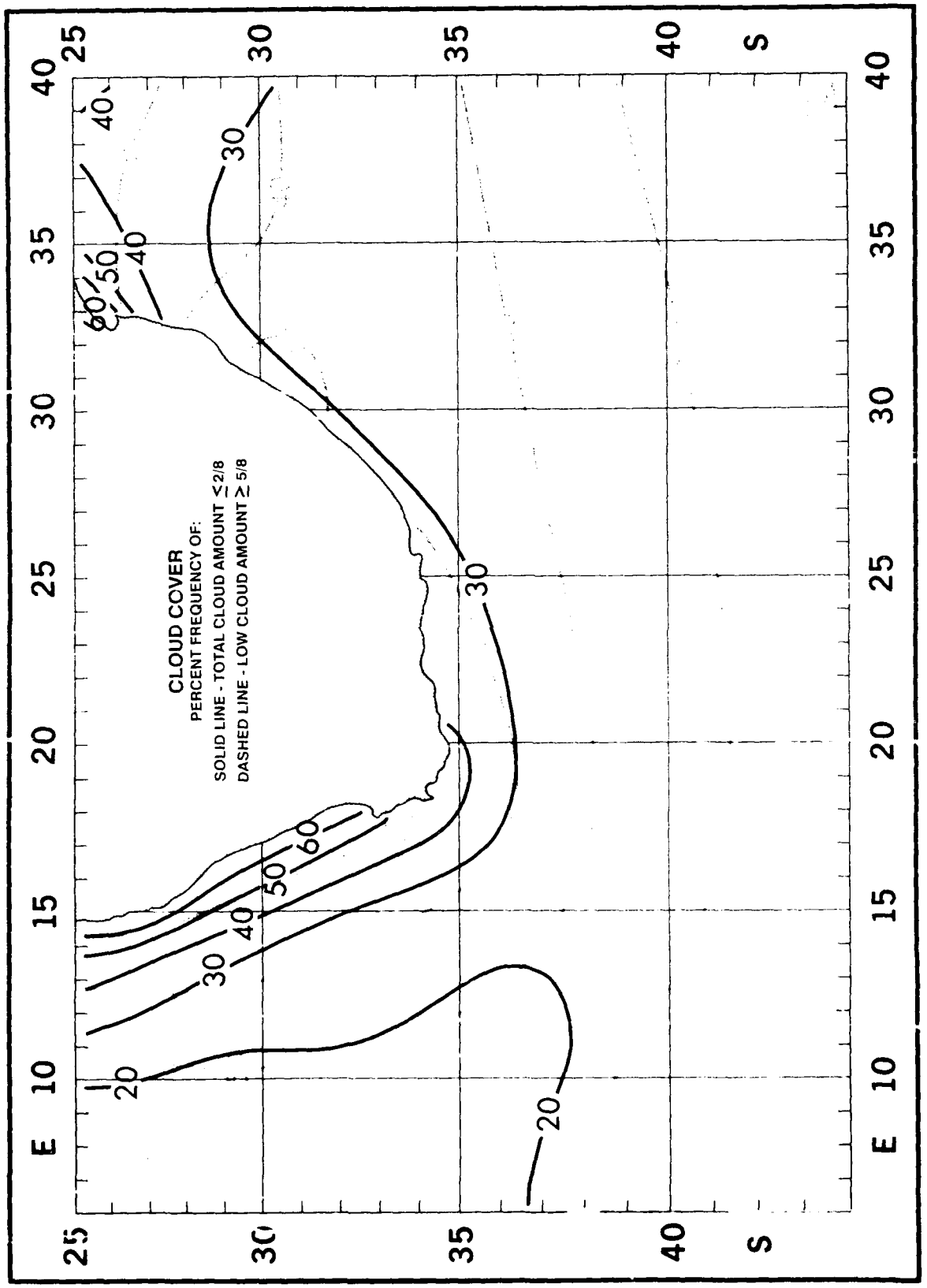
September

Surface Currents



September **Surface Currents**




CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE - TOTAL CLOUD AMOUNT ≤2/8
DASHED LINE - LOW CLOUD AMOUNT ≥ 5/8
E
S
25
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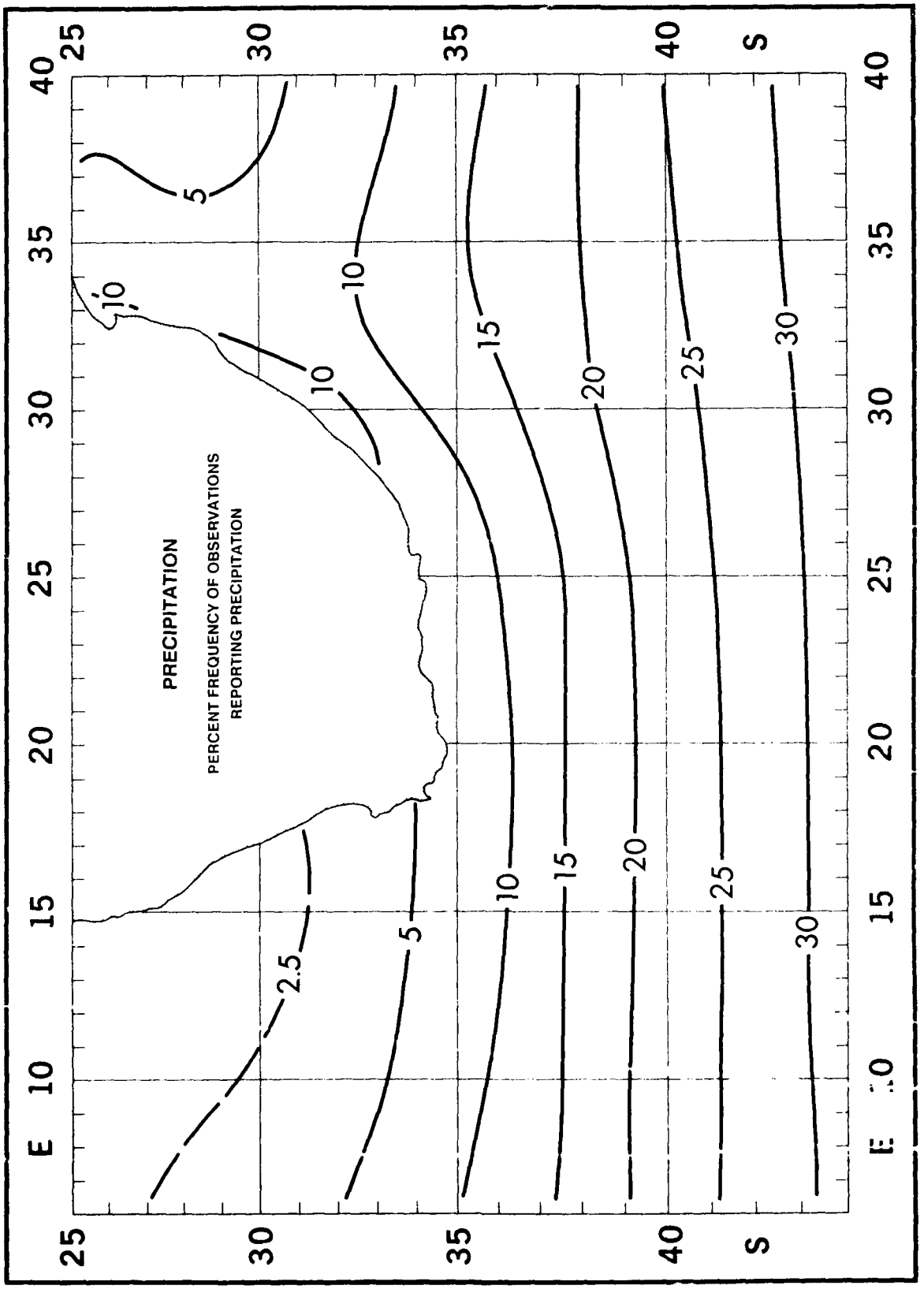
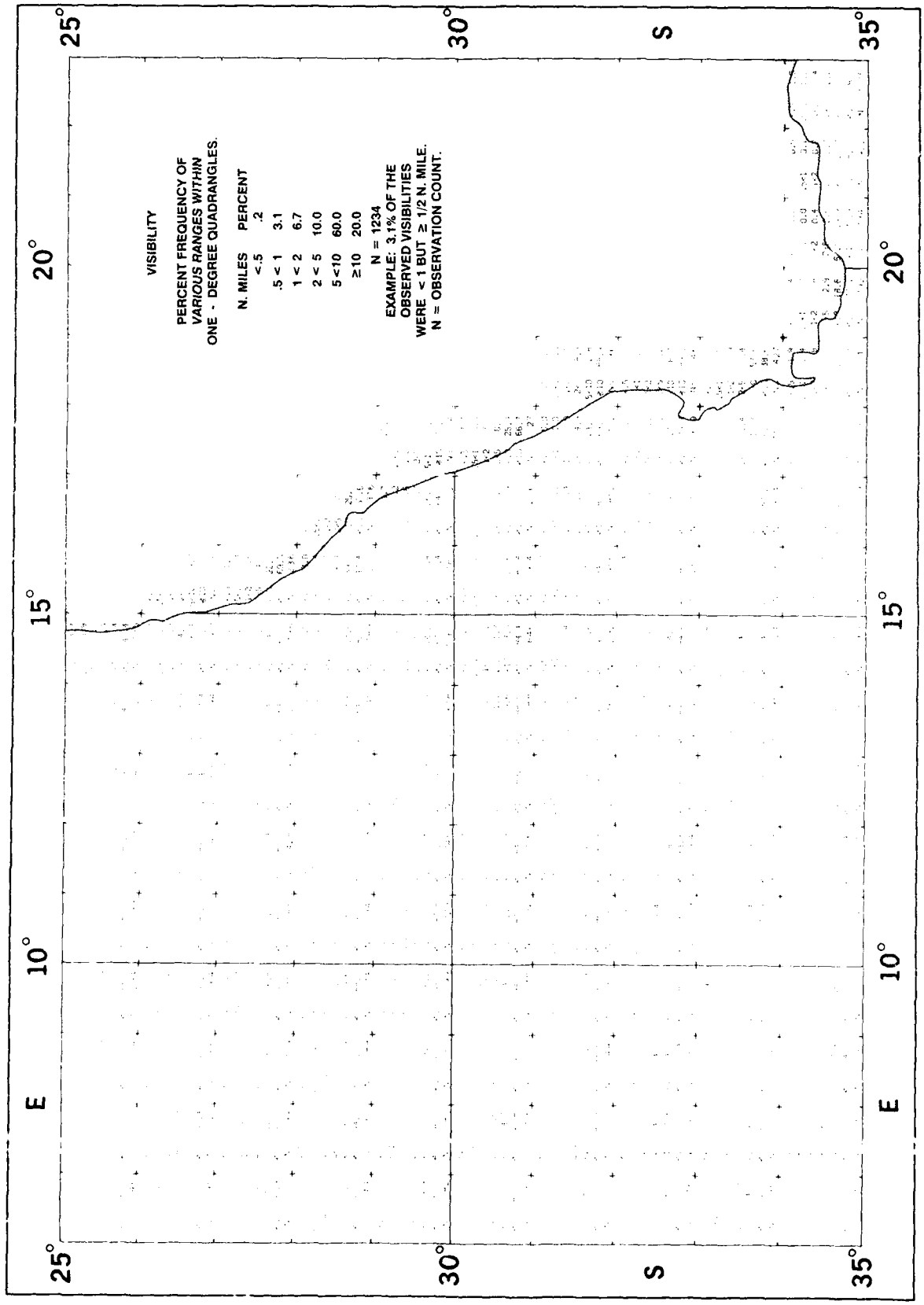
October Precipitation

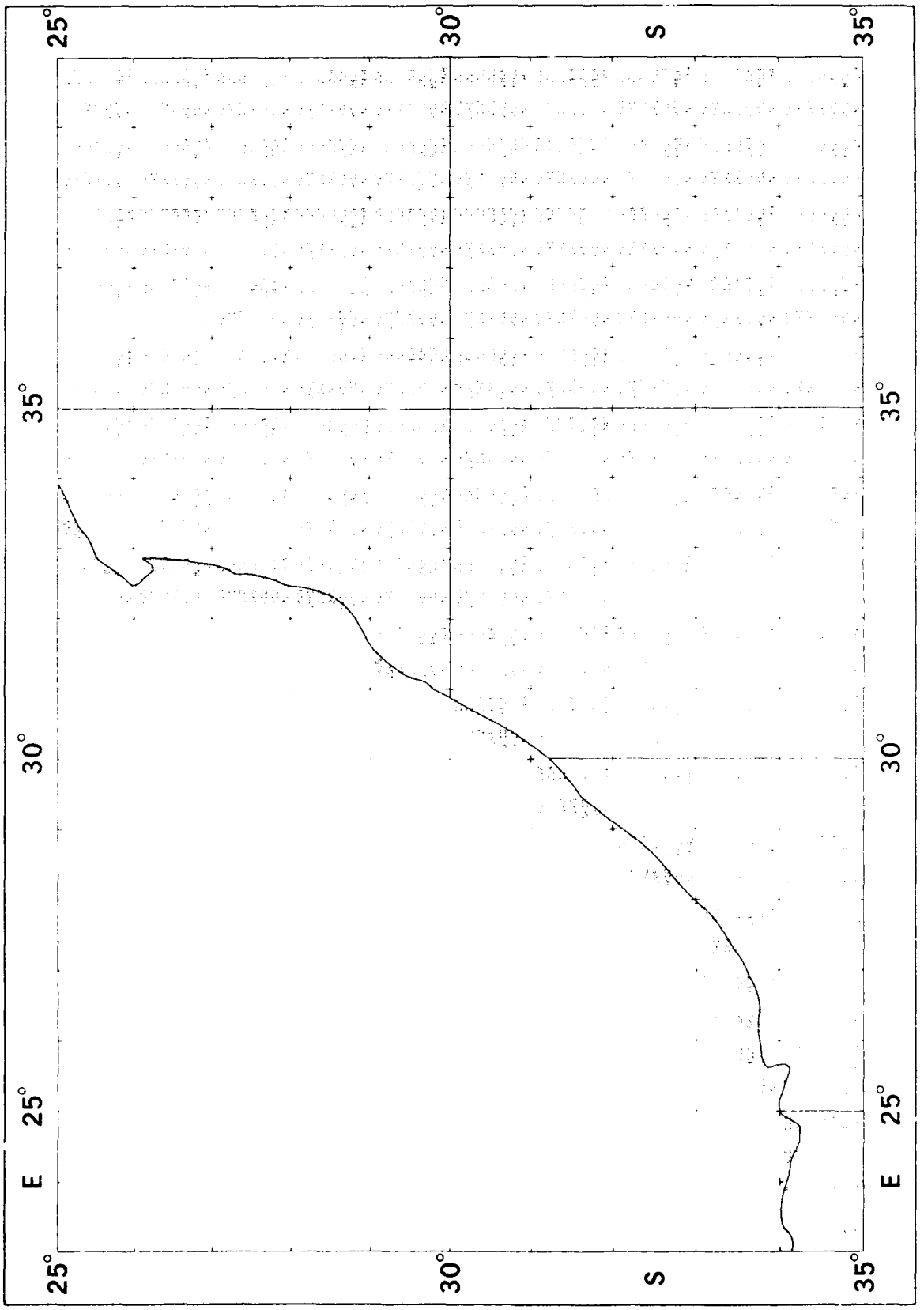


October

Visibility

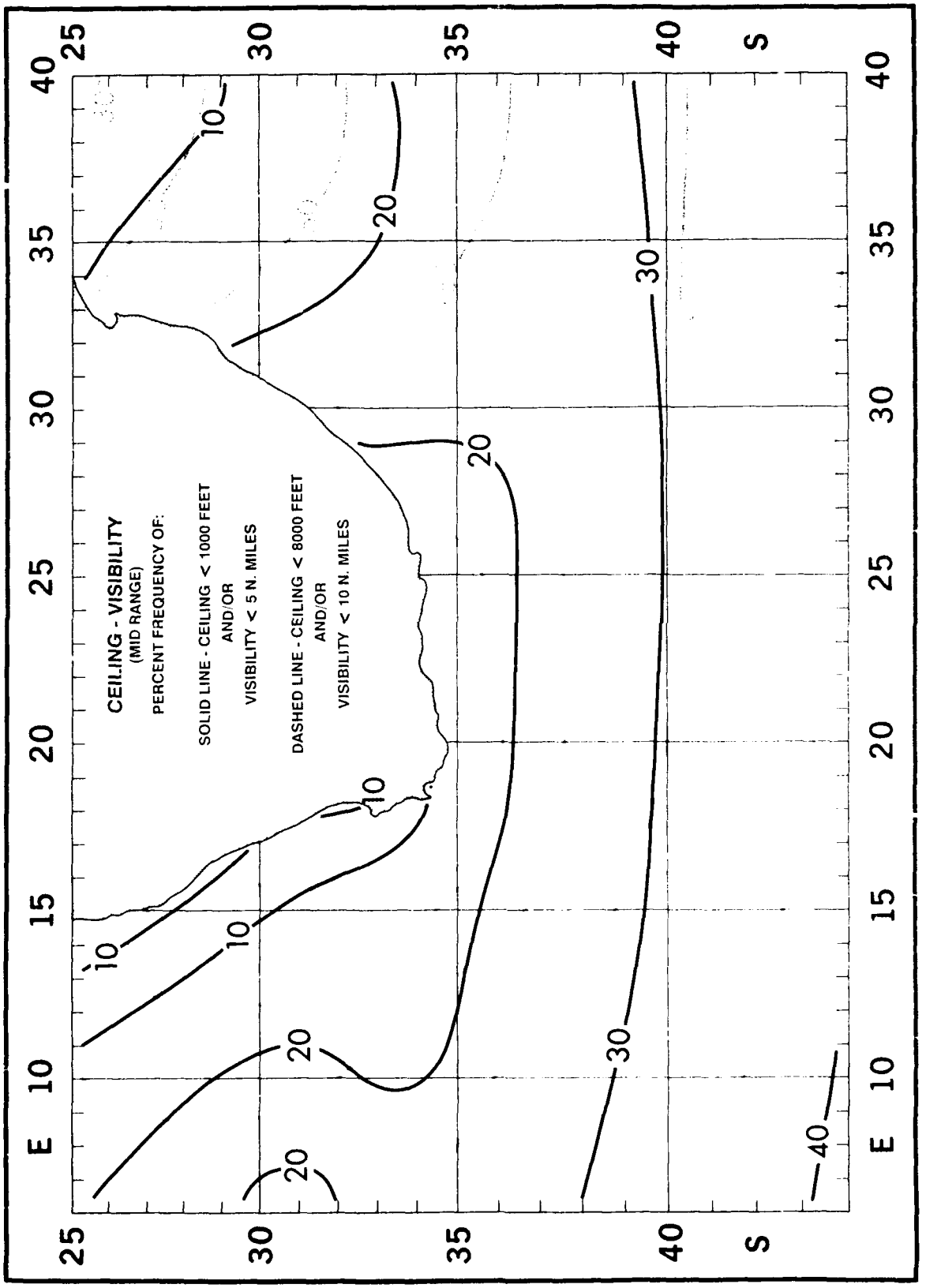


October **Visibility**



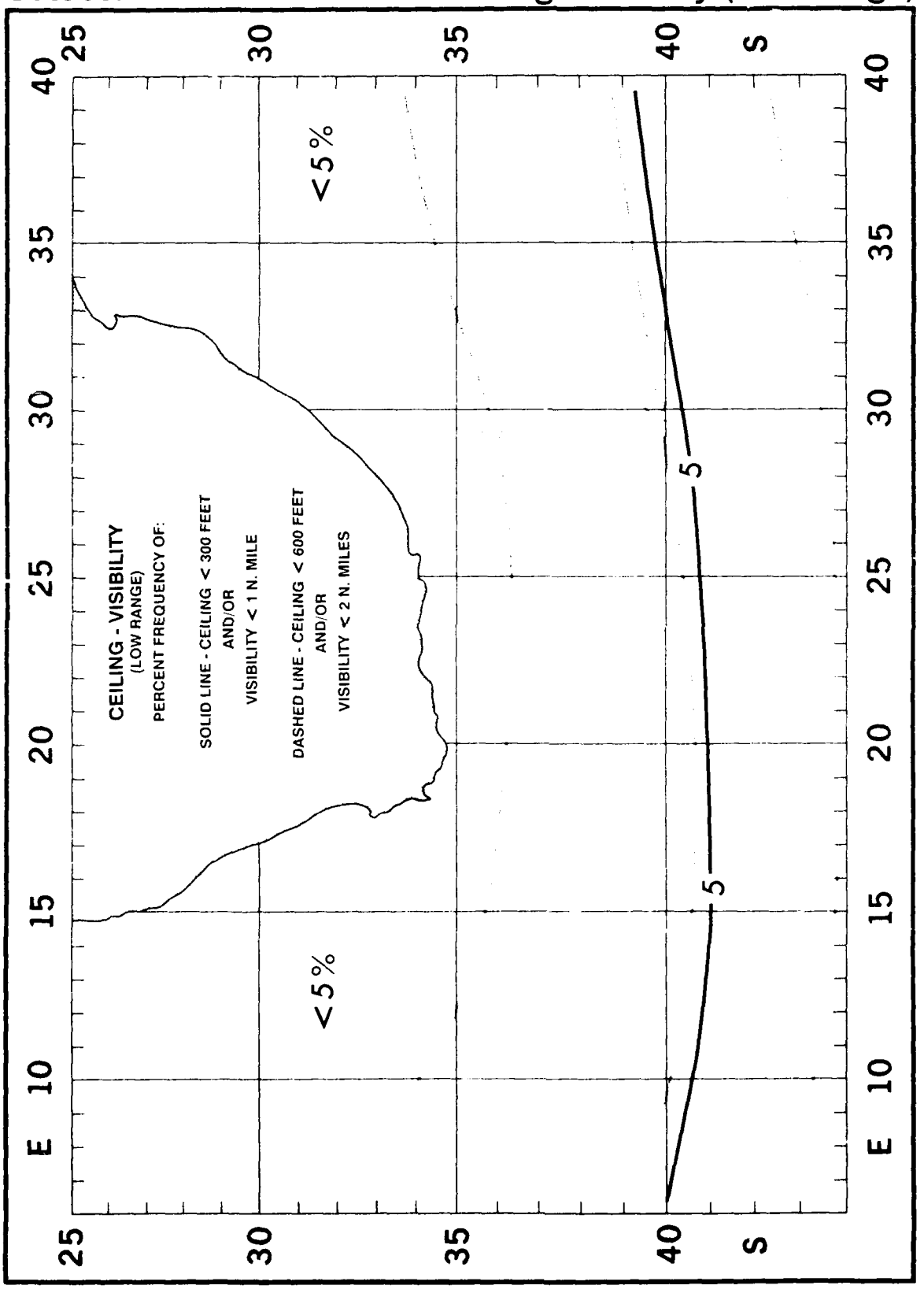
October

Ceiling - Visibility (Mid Range)

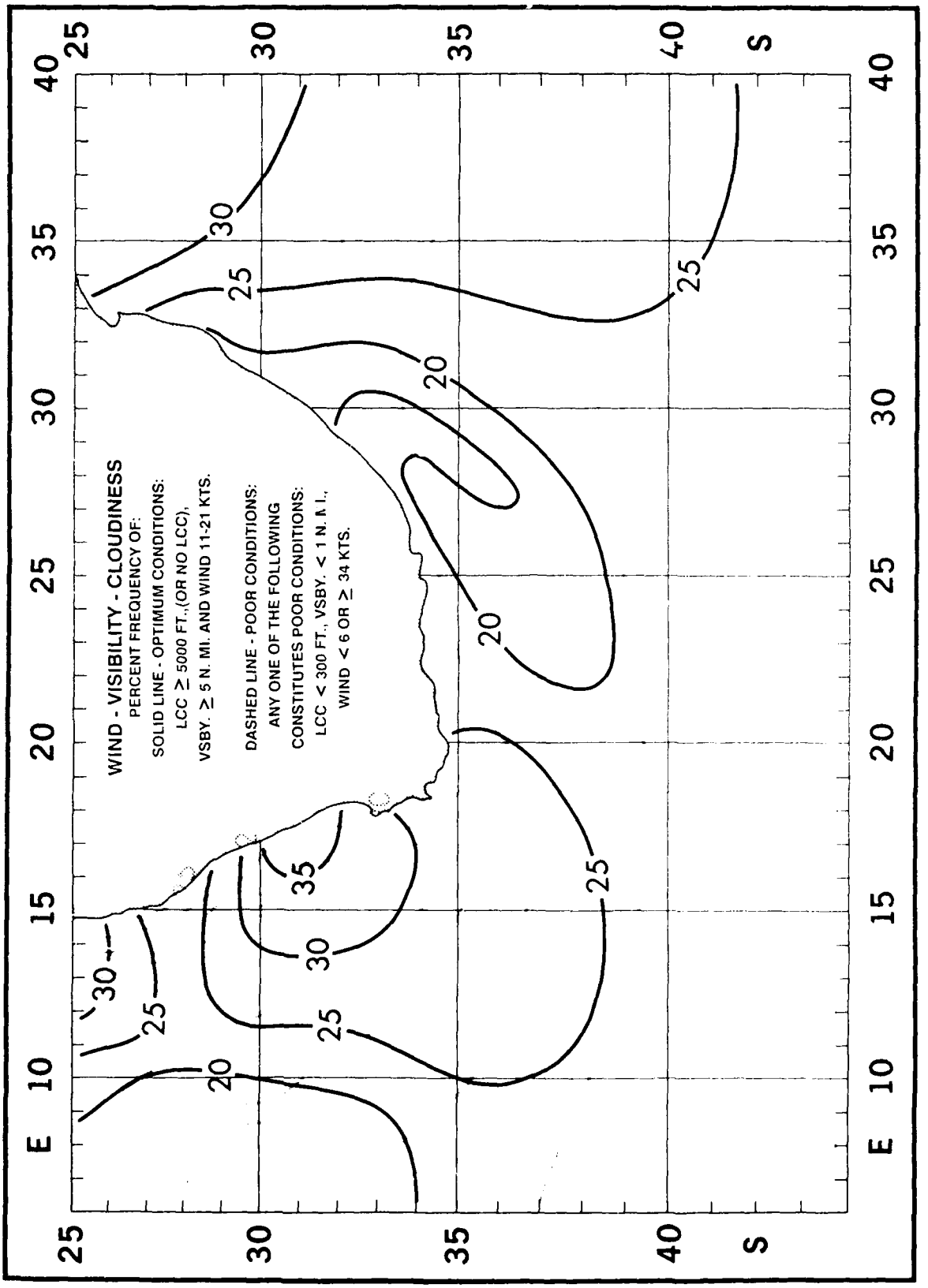


October

Ceiling - Visibility (Low Range)

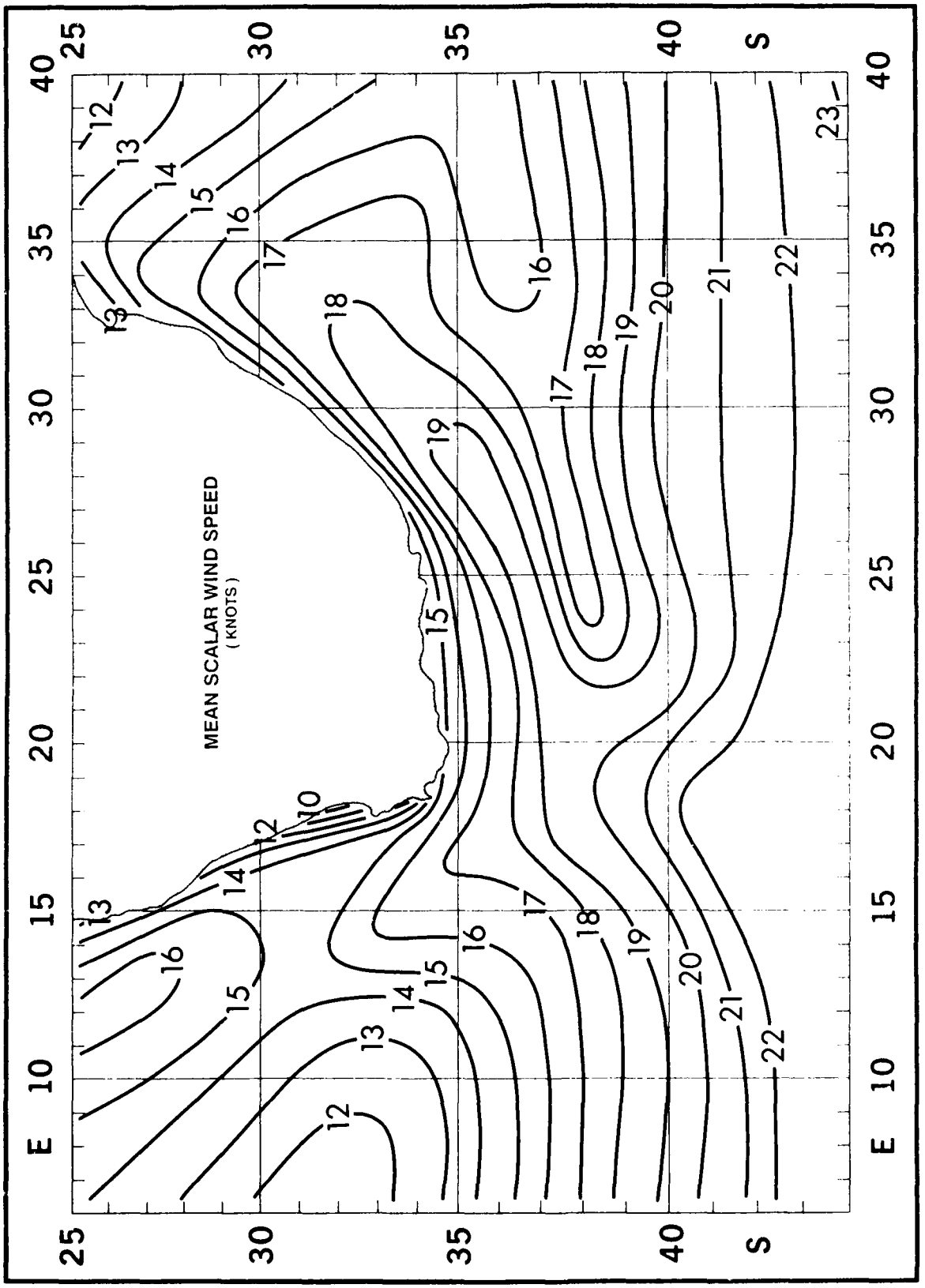


October **Wind - Visibility - Cloudiness**

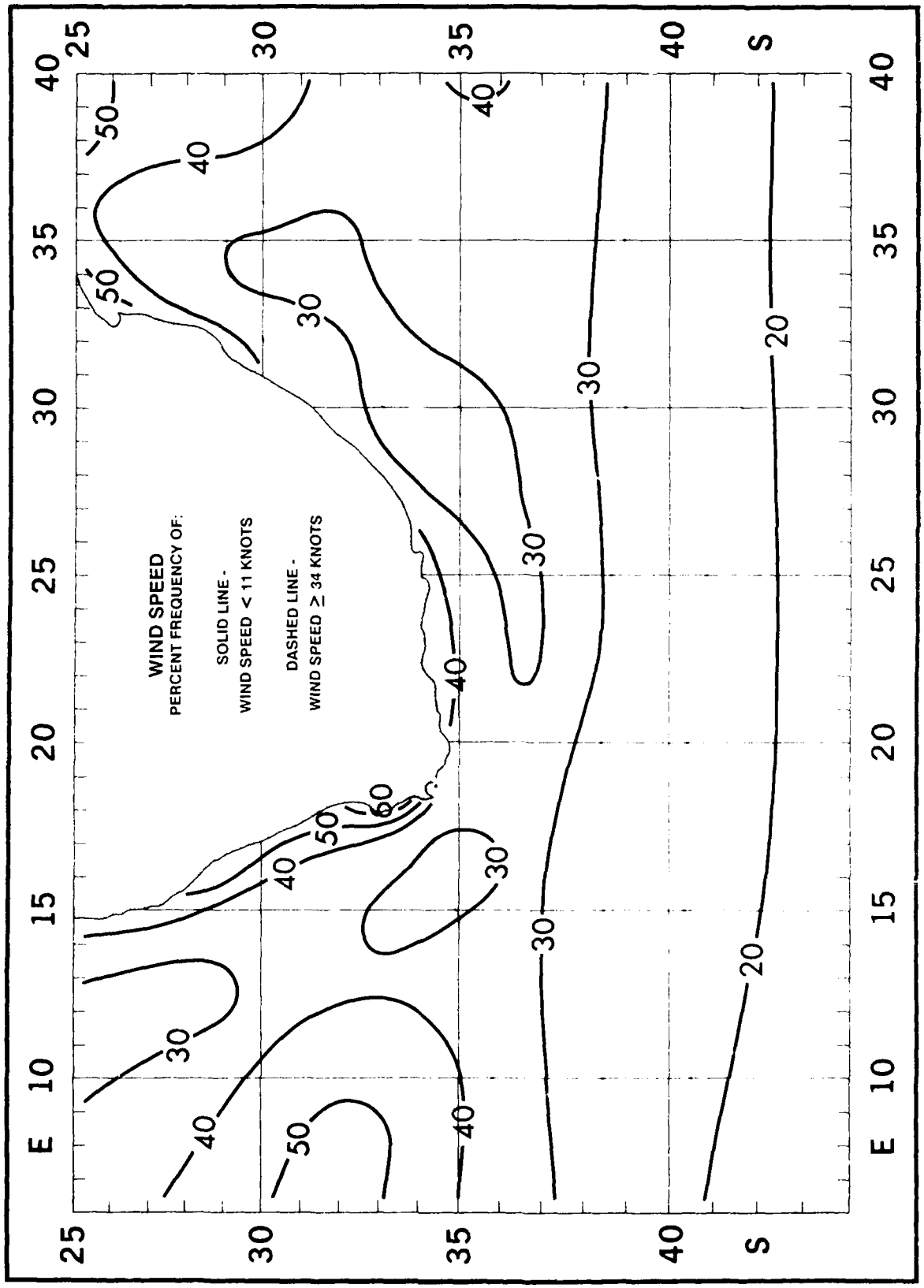


October

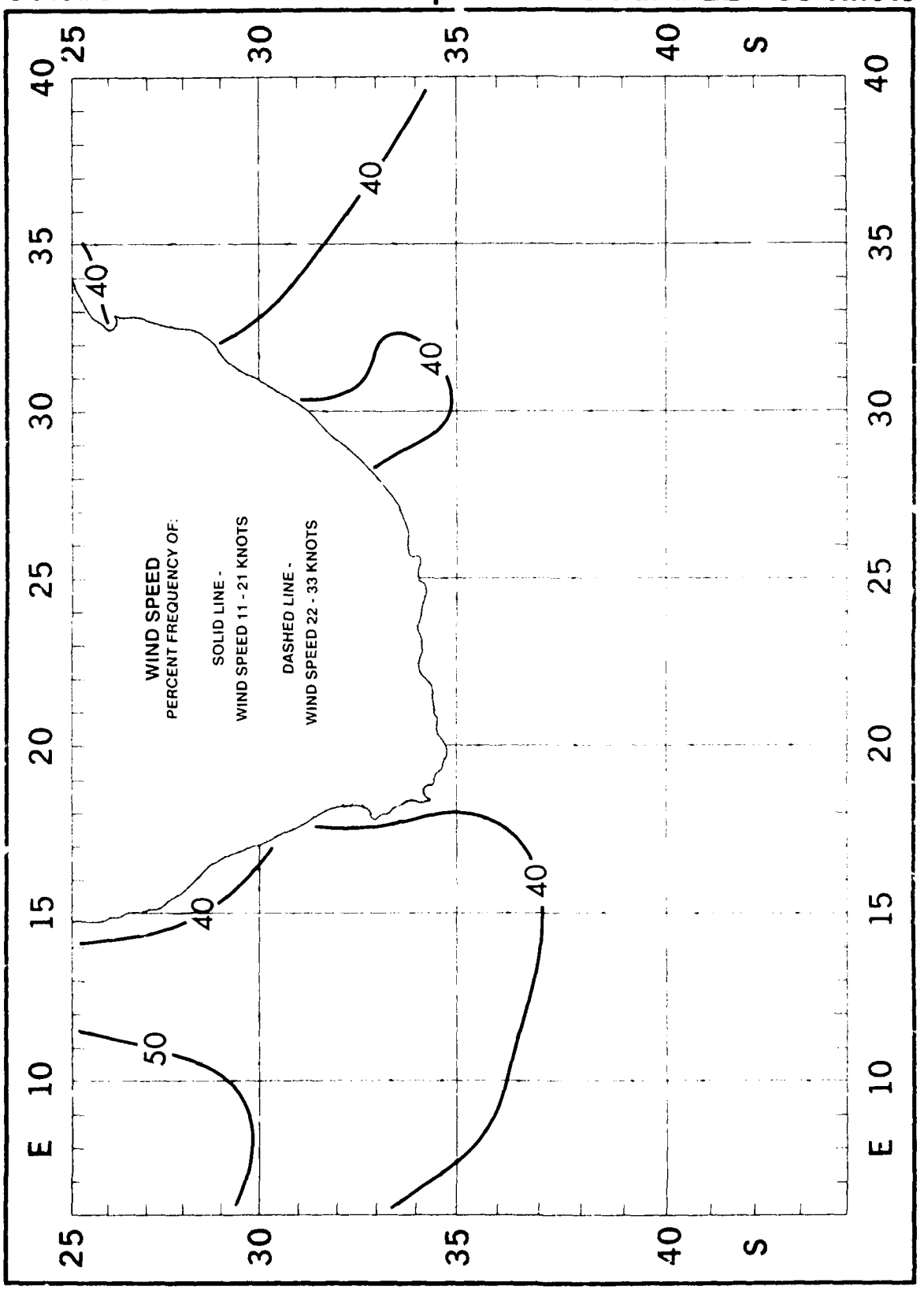
Mean Scalar Wind Speed



October **Wind Speed ≤11 and ≥34 Knots**

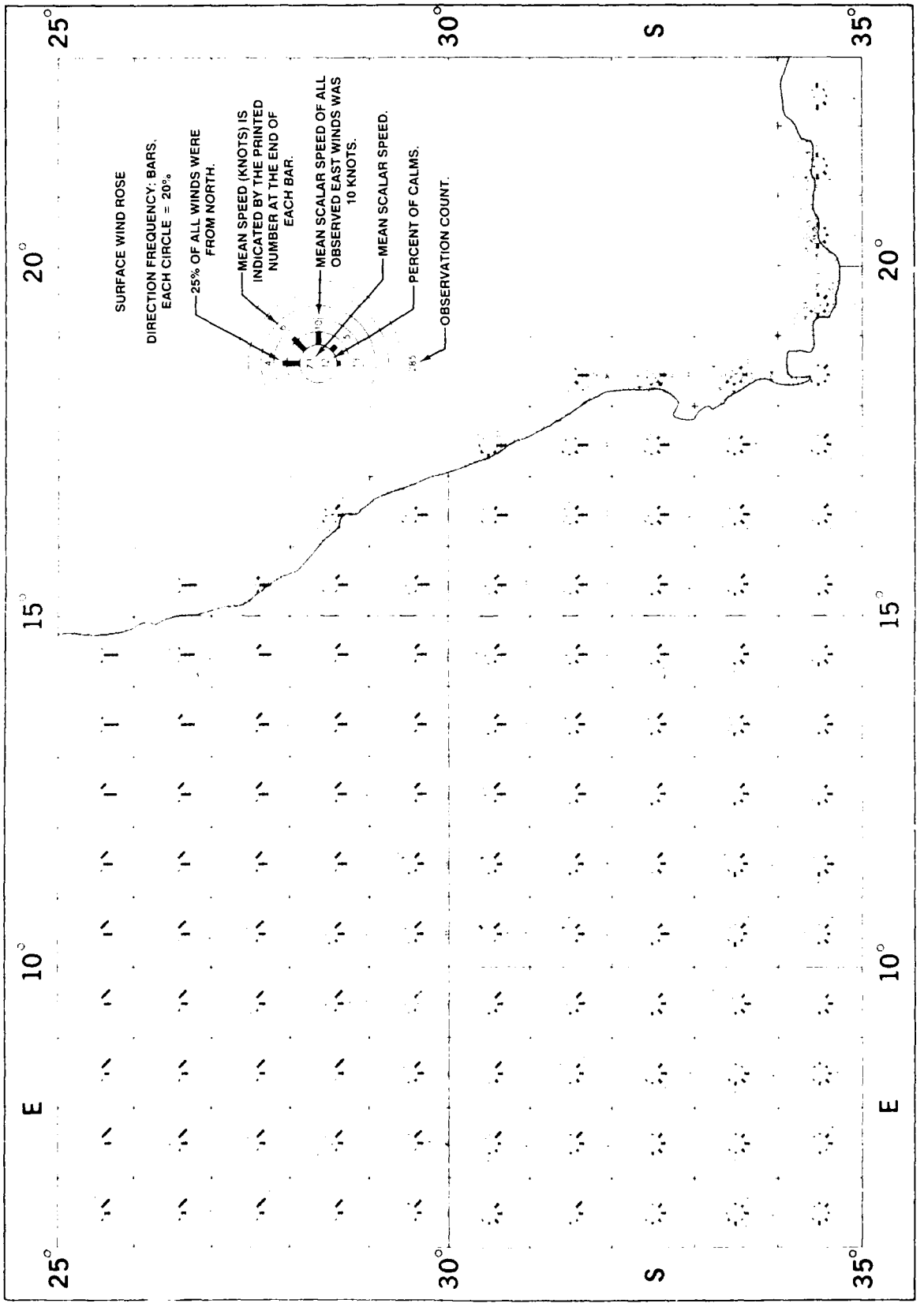


October Wind Speed 11 - 21 and 22 - 33 Knots



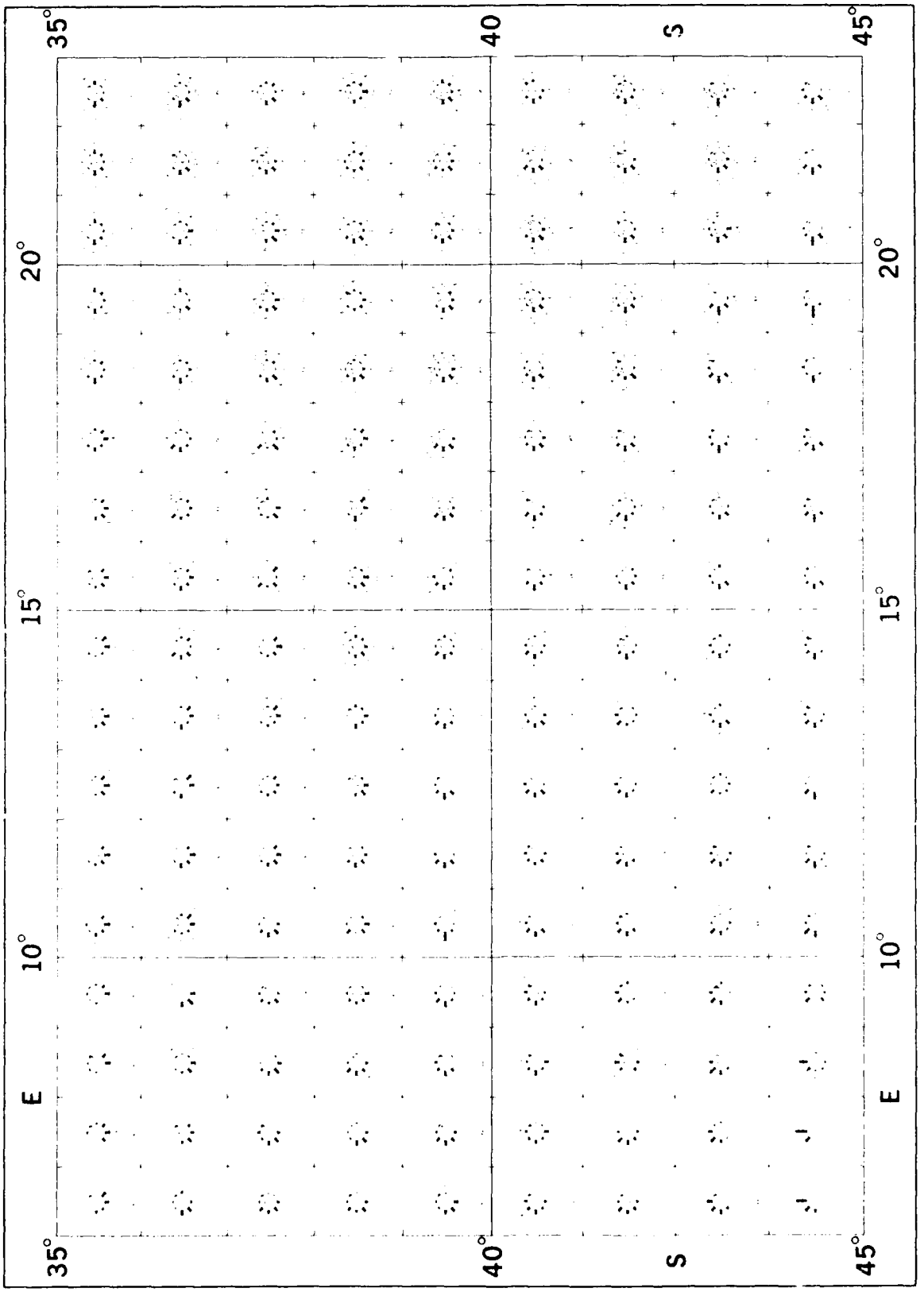
October

Surface Wind Roses



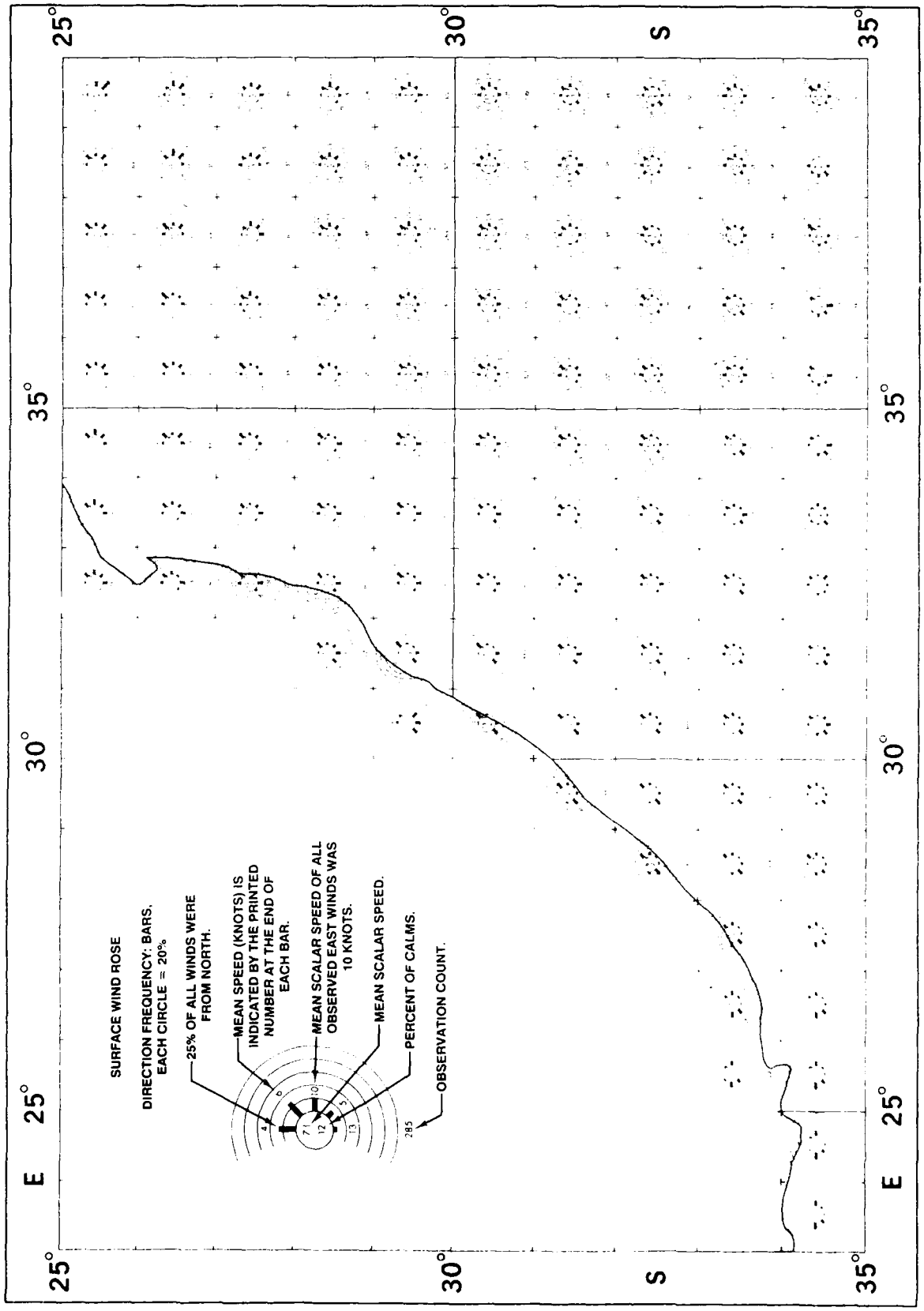
October

Surface Wind Roses



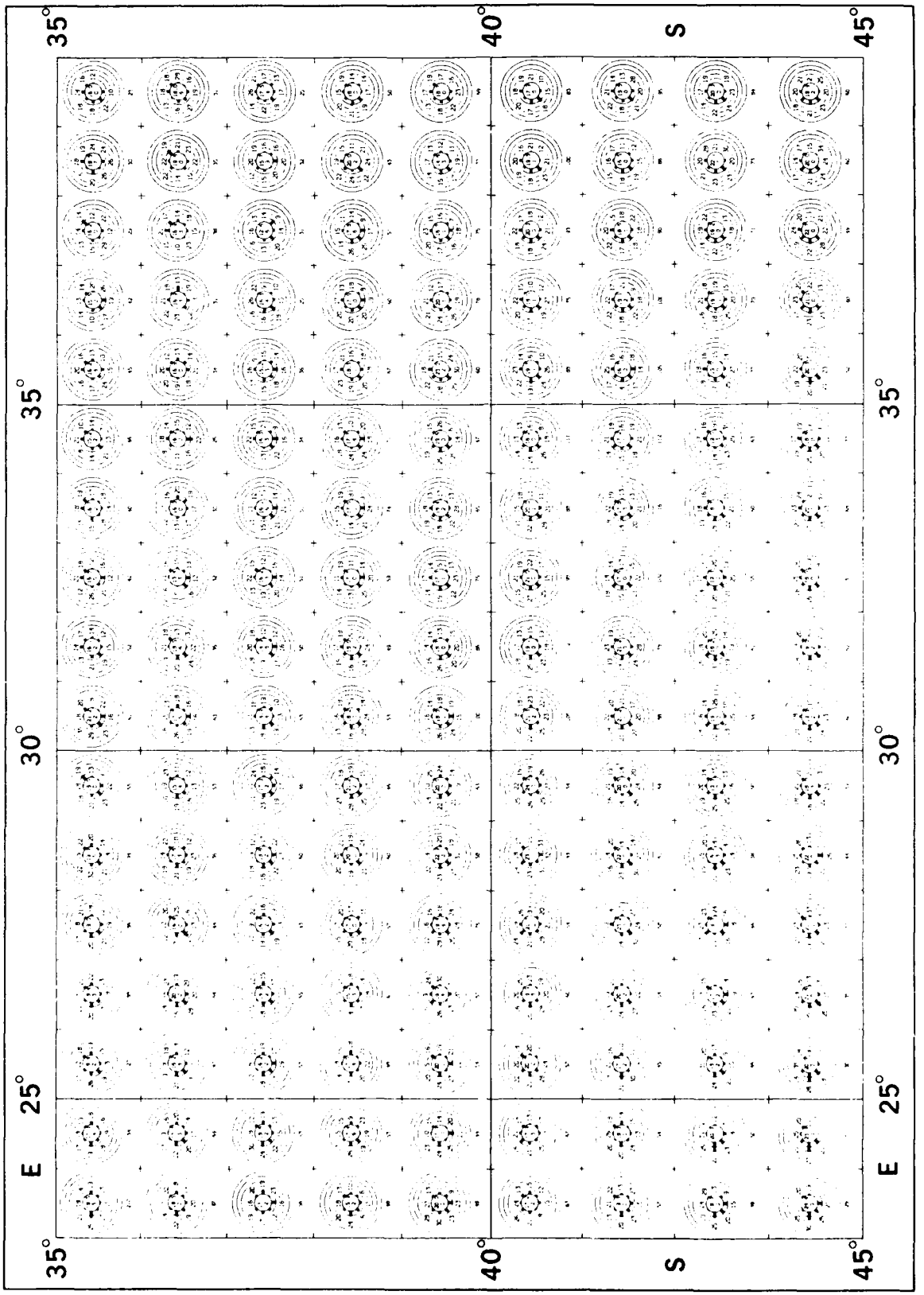
October

Surface Wind Roses



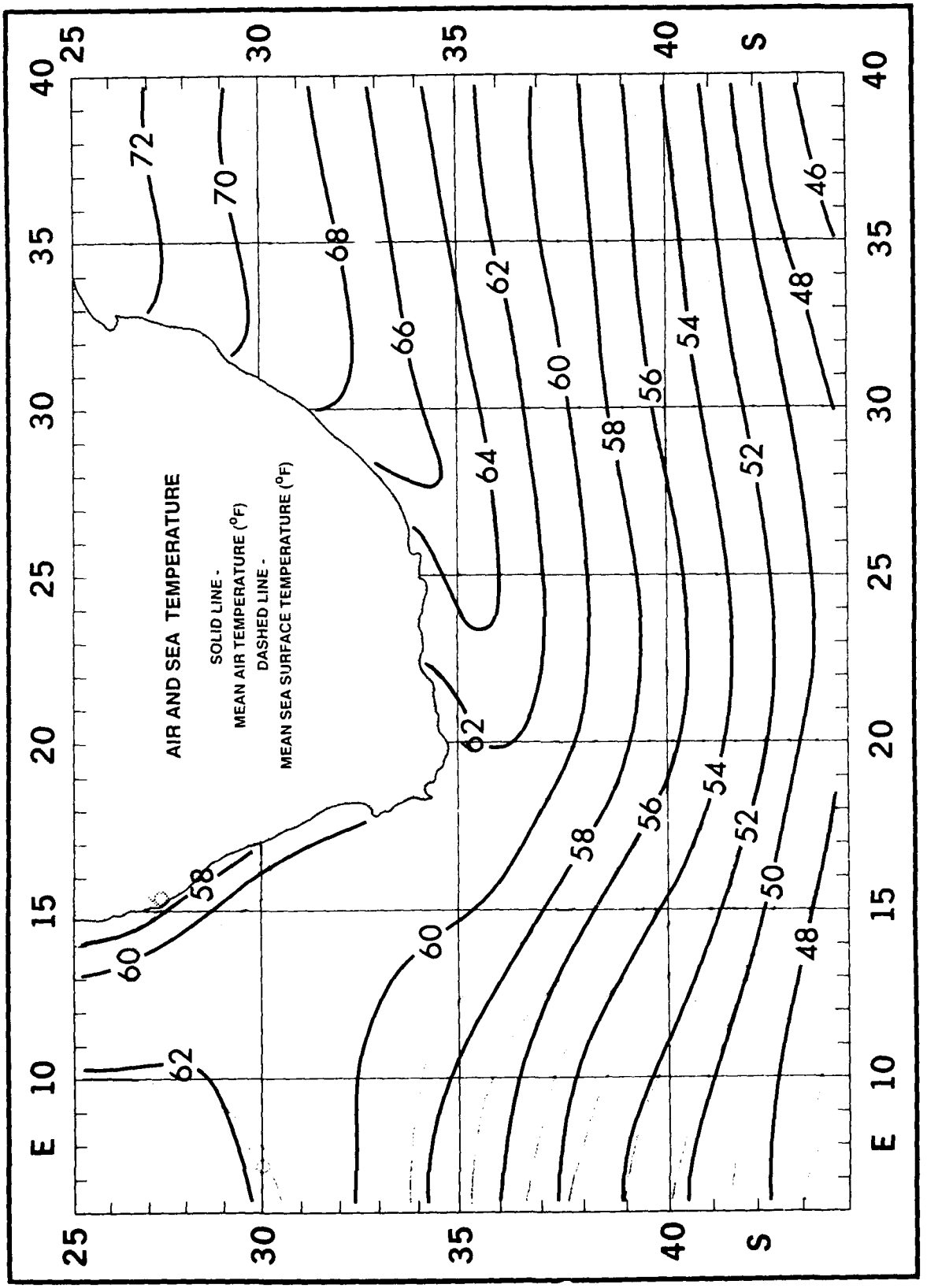
October

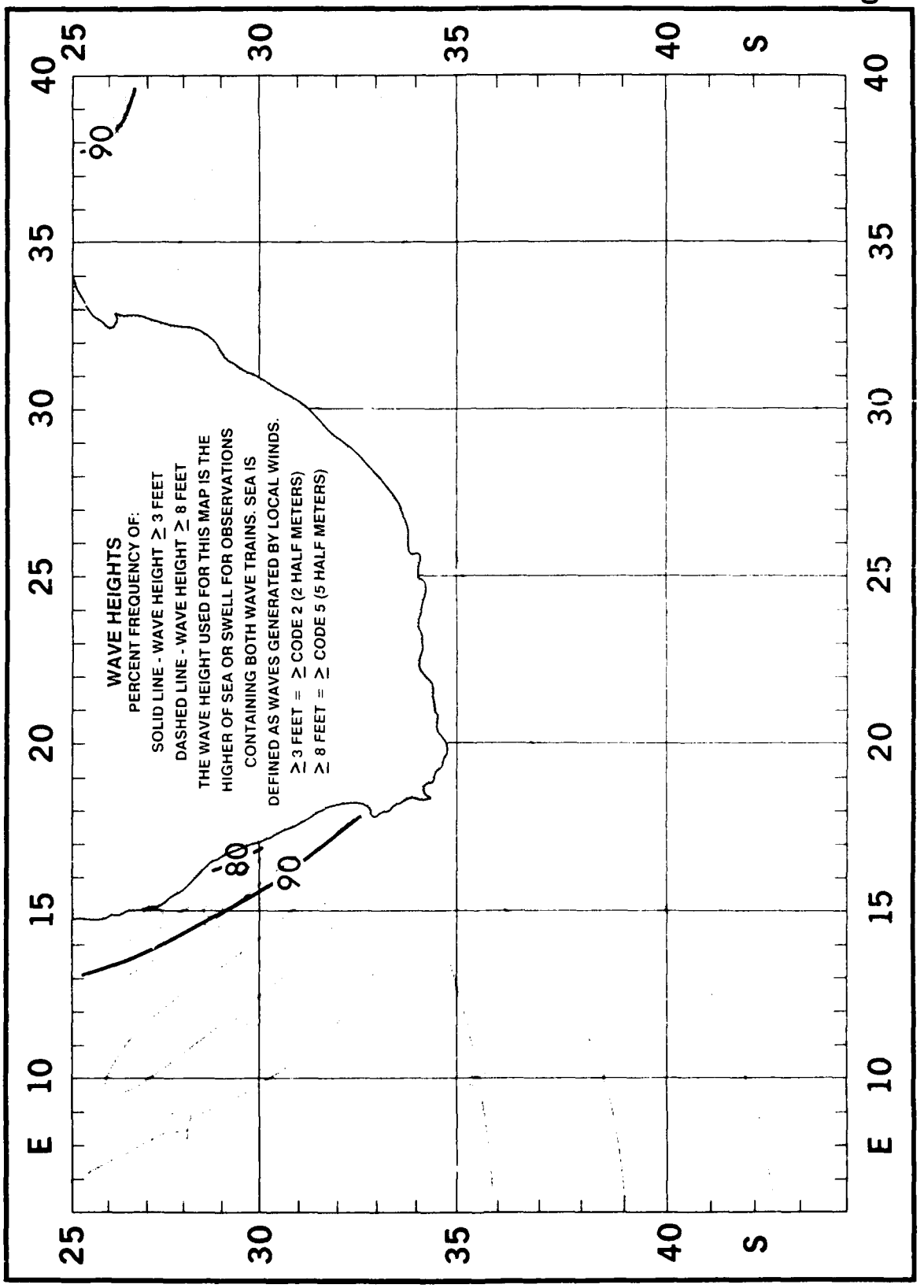
Surface Wind Roses



October

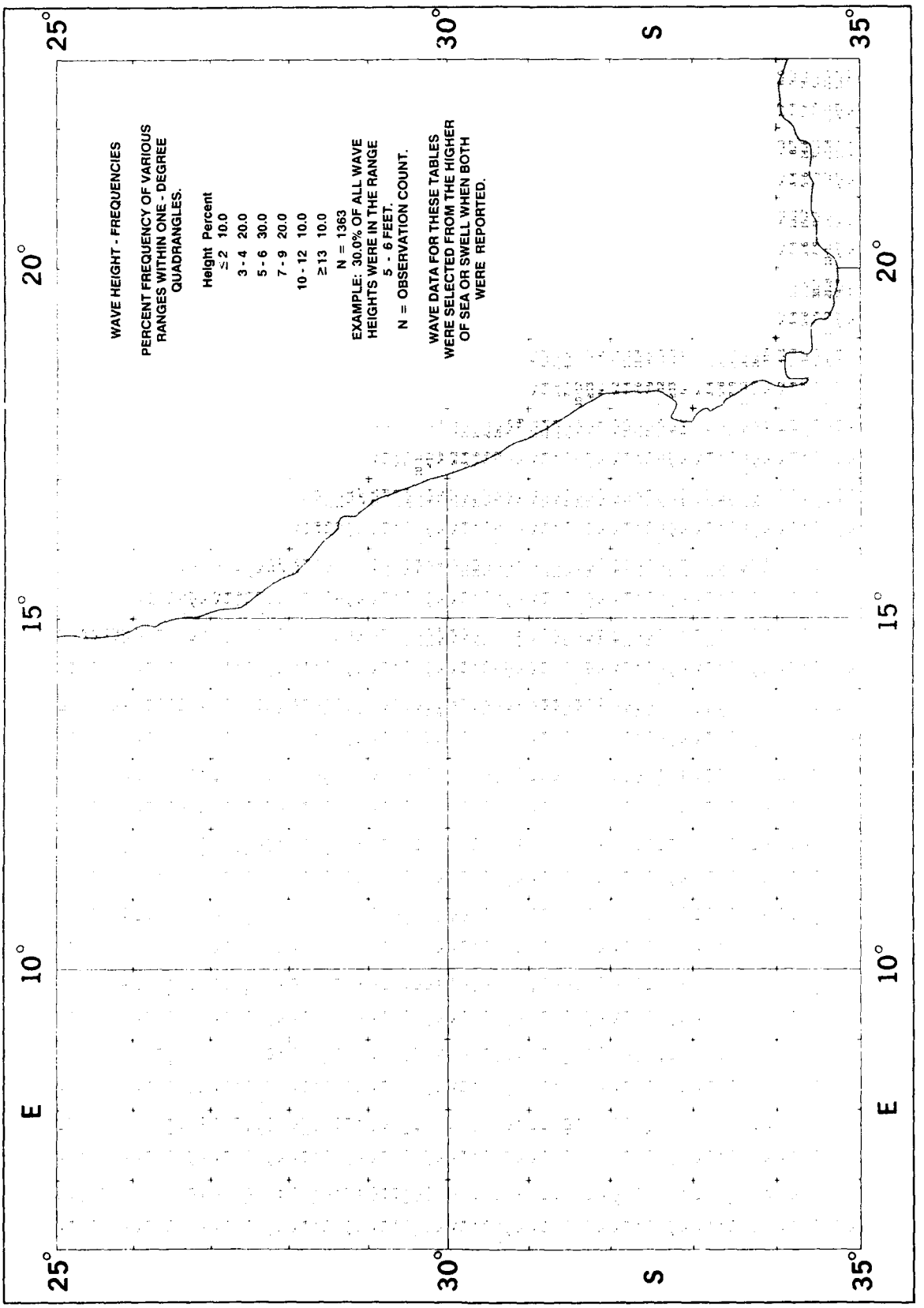
Air and Sea Temperature



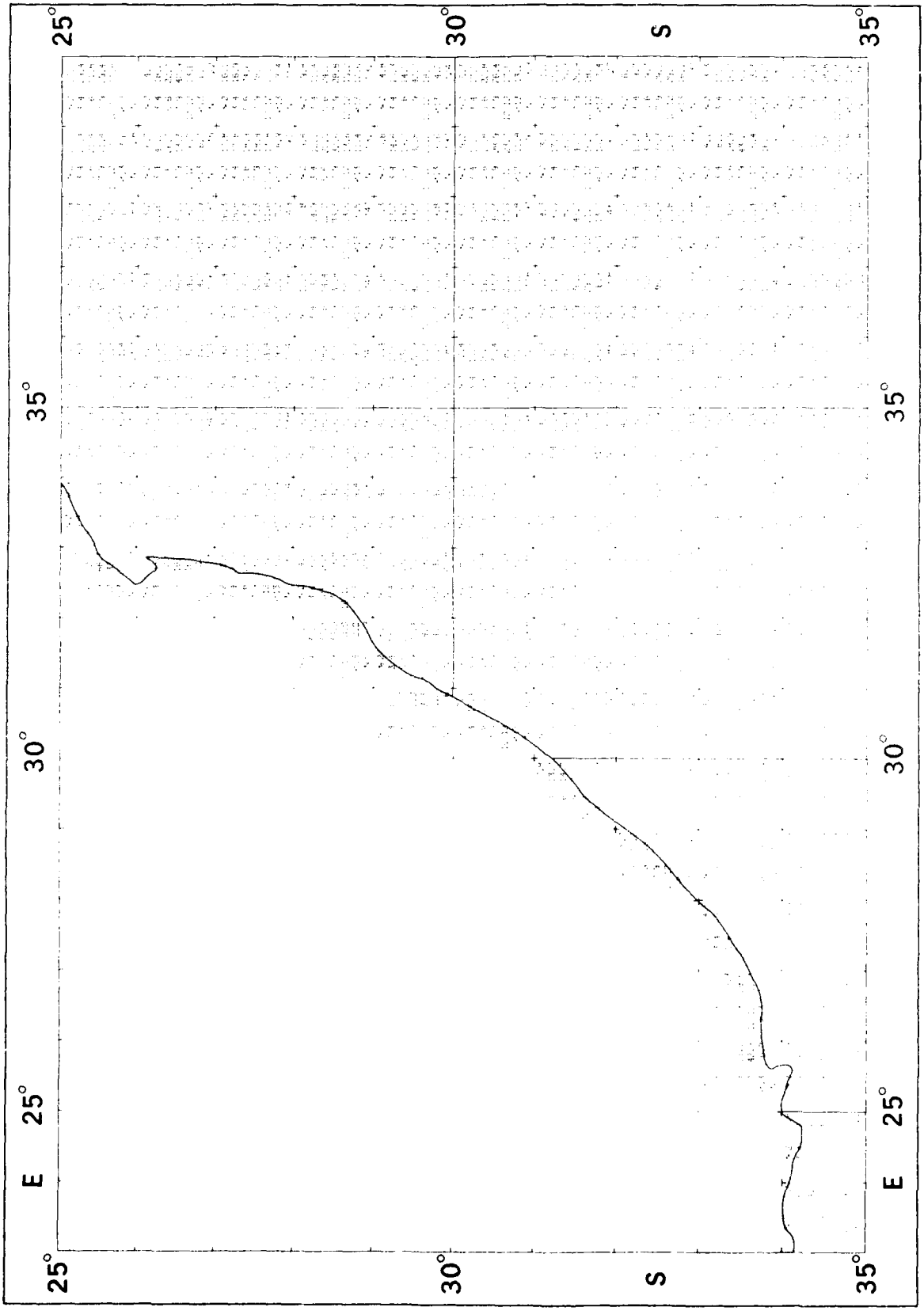

WAVE HEIGHTS
PERCENT FREQUENCY OF:
SOLID LINE - WAVE HEIGHT ≥ 3 FEET
DASHED LINE - WAVE HEIGHT ≥ 8 FEET
THE WAVE HEIGHT USED FOR THIS MAP IS THE HIGHER OF SEA OR SWELL FOR OBSERVATIONS CONTAINING BOTH WAVE TRAINS. SEA IS DEFINED AS WAVES GENERATED BY LOCAL WINDS.
≥ 3 FEET = ≥ CODE 2 (2 HALF METERS)
≥ 8 FEET = ≥ CODE 5 (5 HALF METERS)
90
80
90
25
30
35
40
S
E 10
15
20
25
30
35
40

October

Wave Height

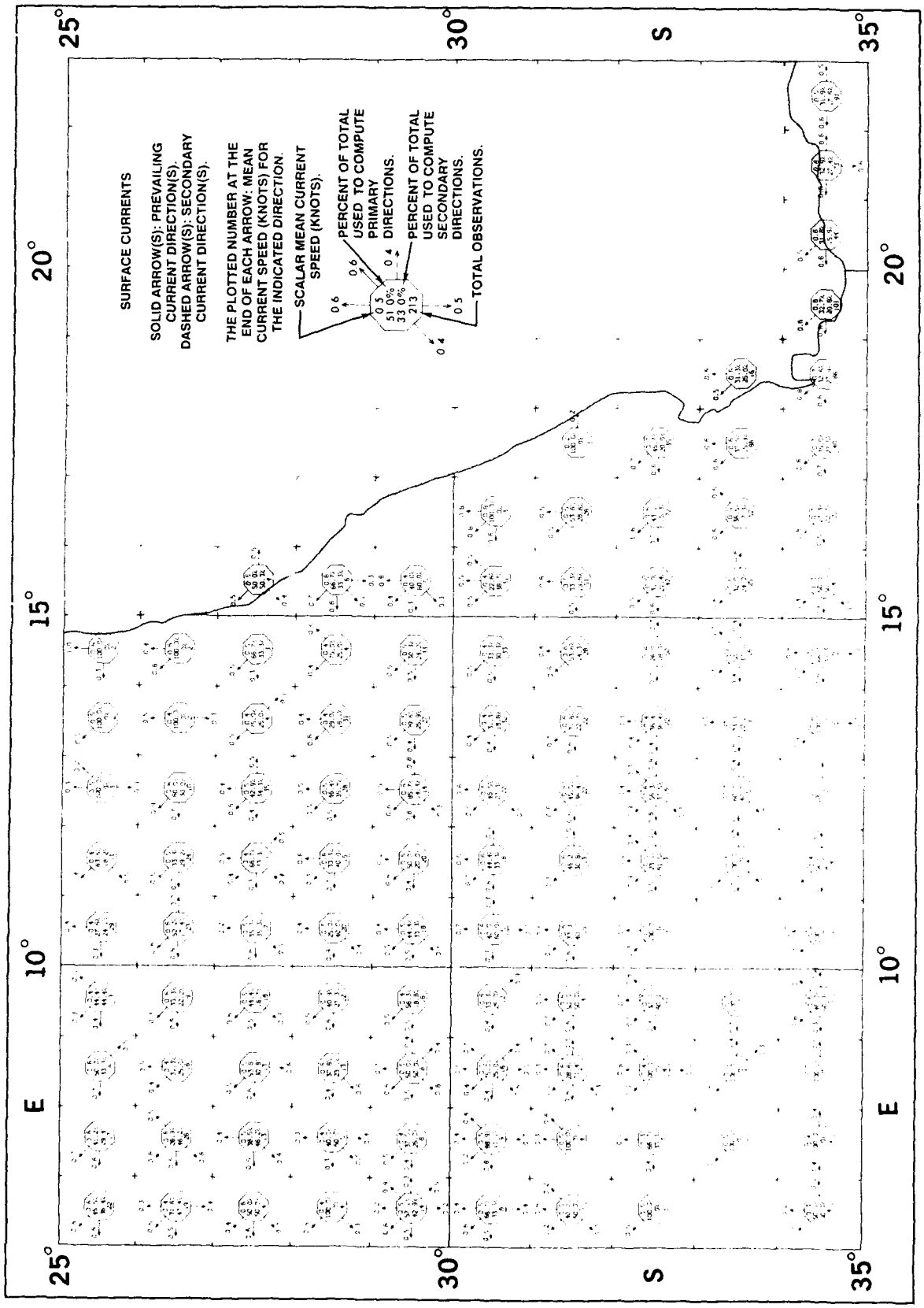


October **Wave Height**



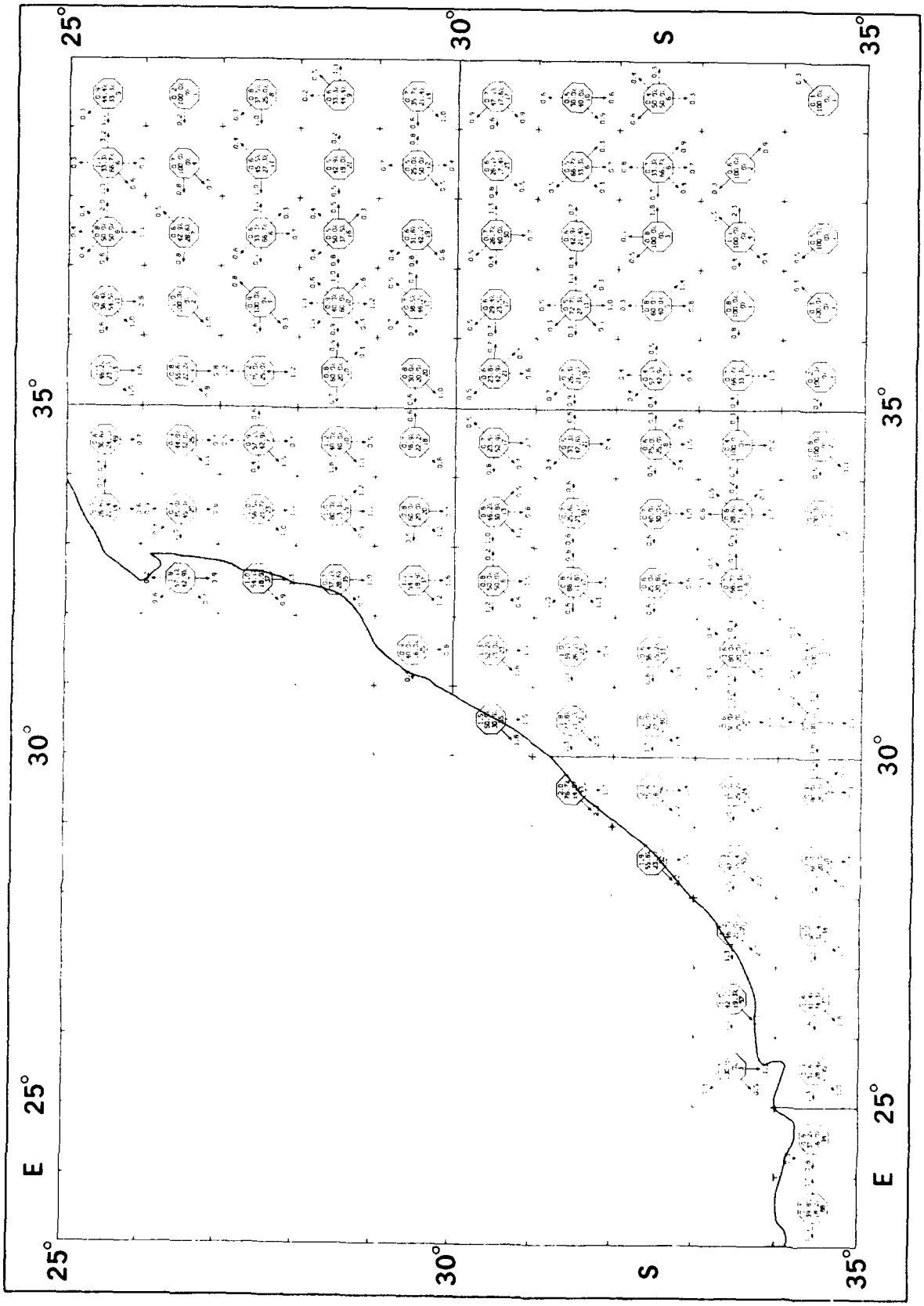
October

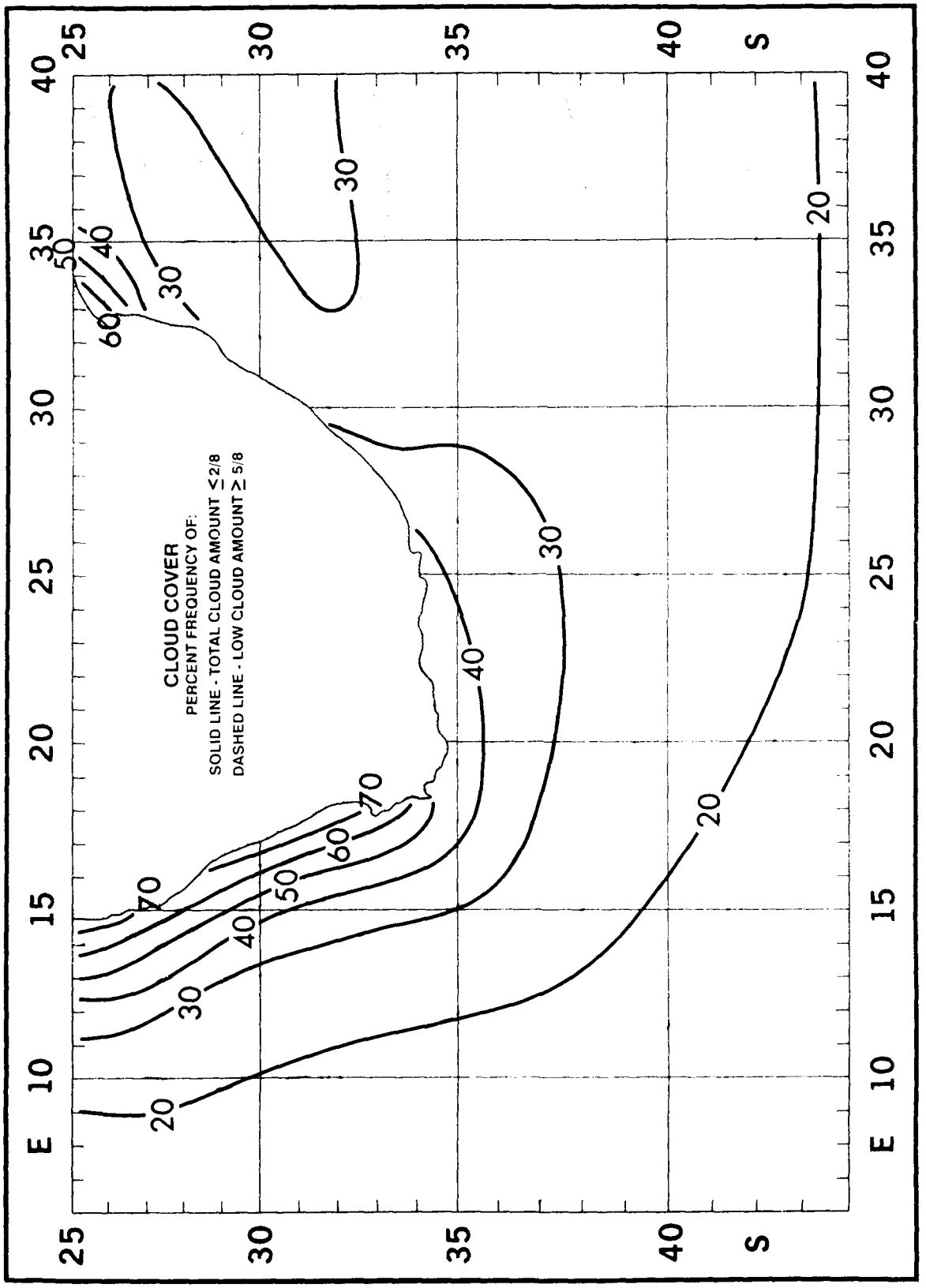
Surface Currents



October

Surface Currents




CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE - TOTAL CLOUD AMOUNT ≤ 2/8
DASHED LINE - LOW CLOUD AMOUNT ≥ 5/8
E
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25
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10
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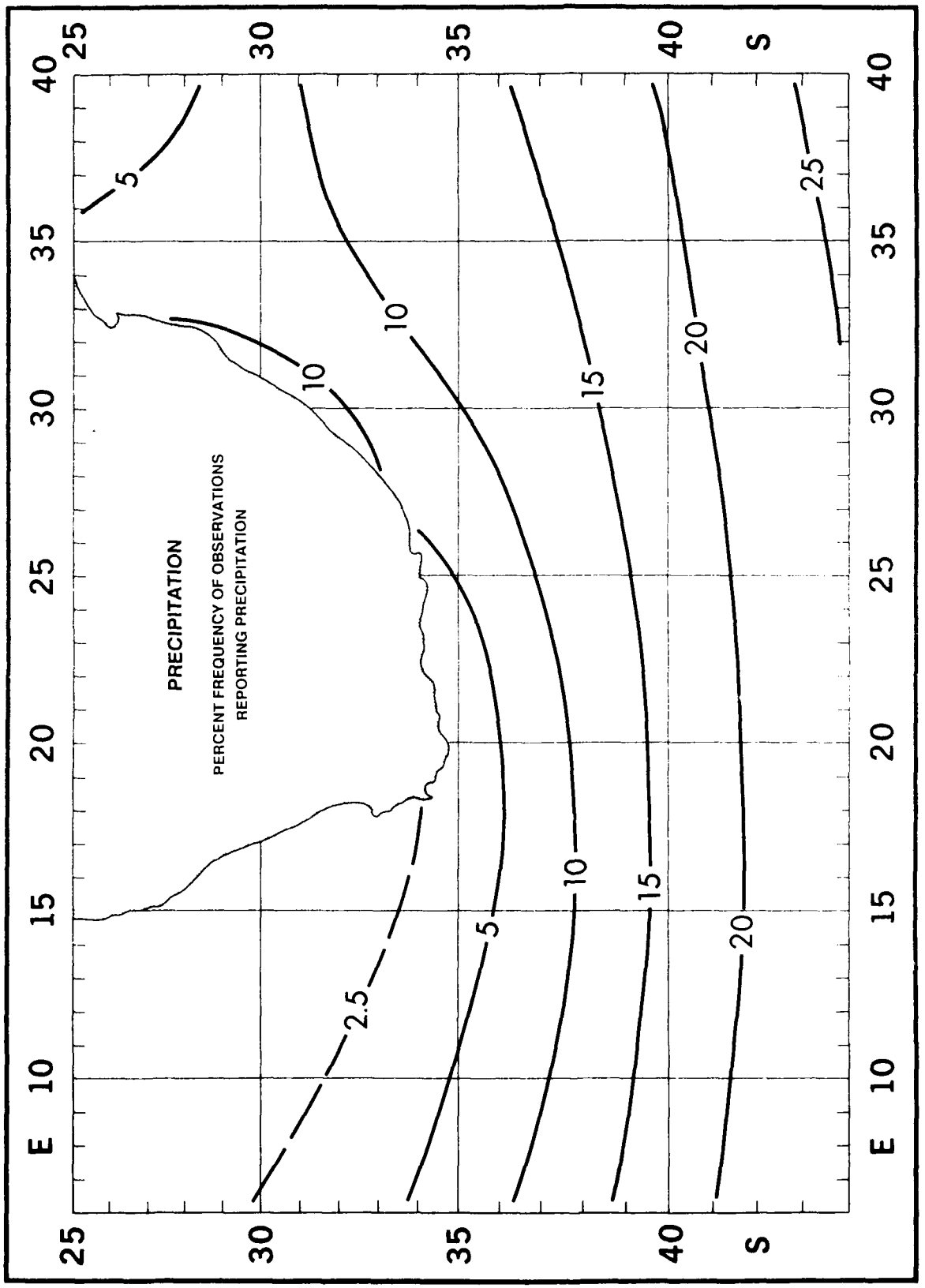
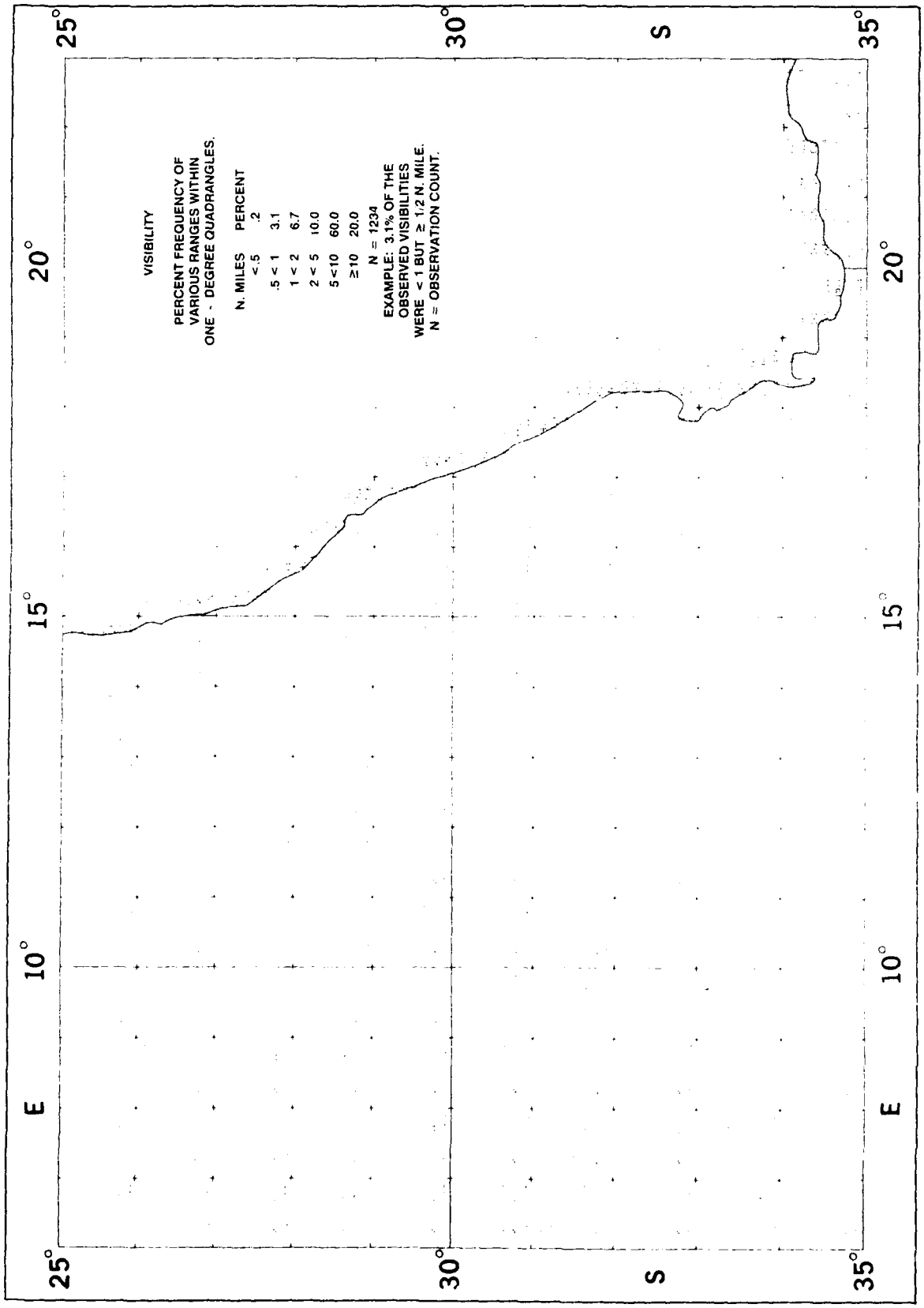
70
60
50
40
30
20

November **Precipitation**



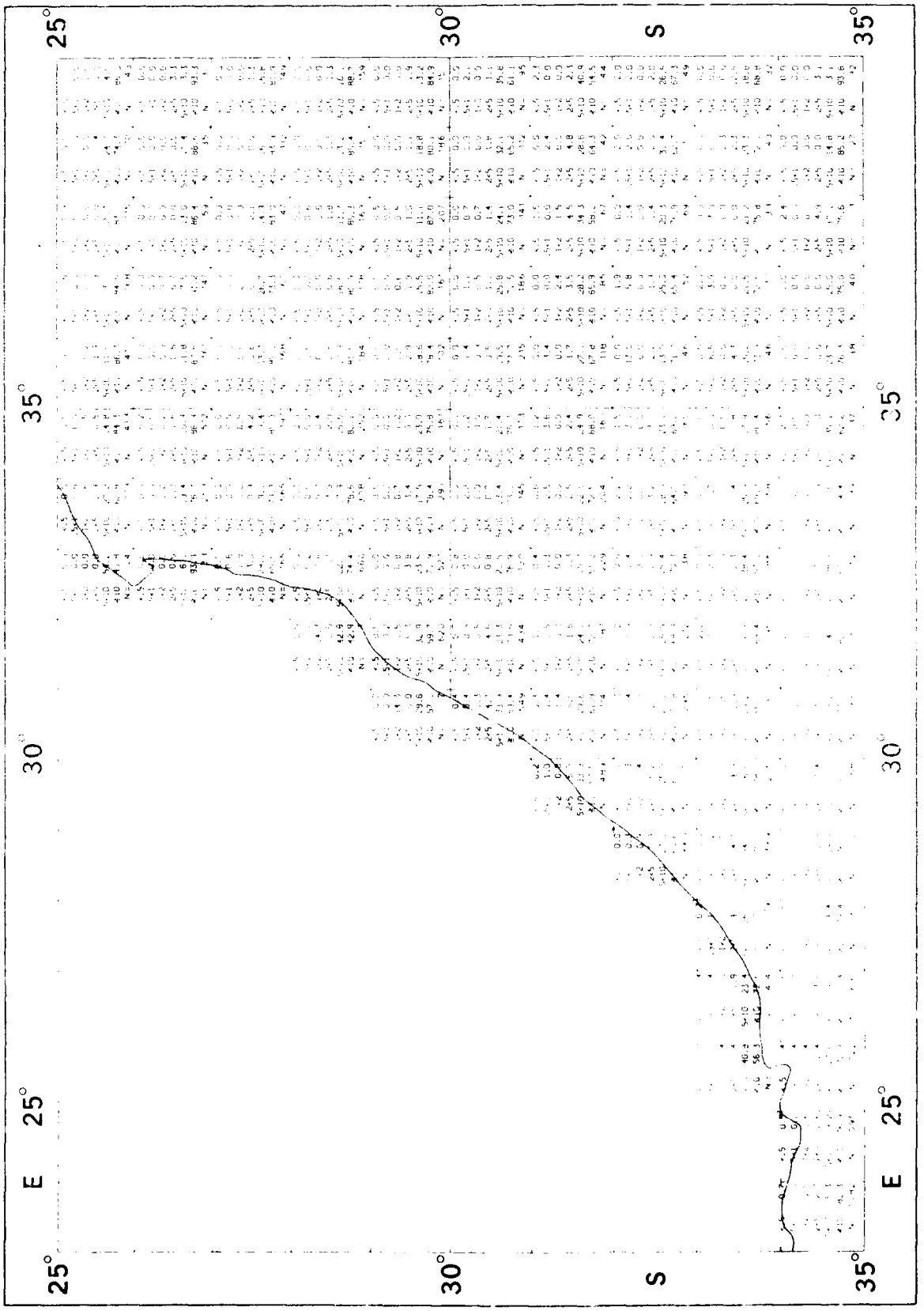
November

Visibility



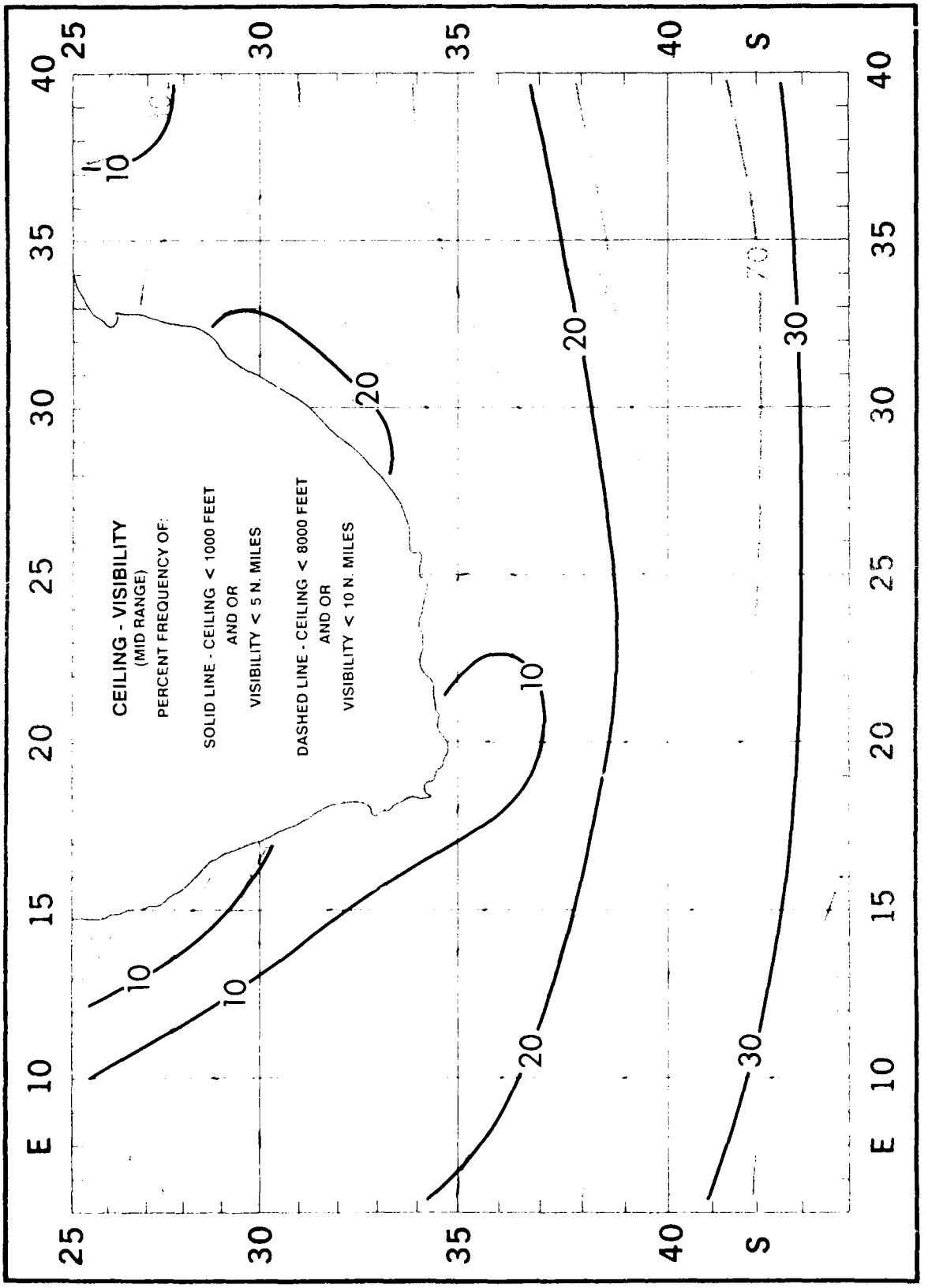
November

Visibility

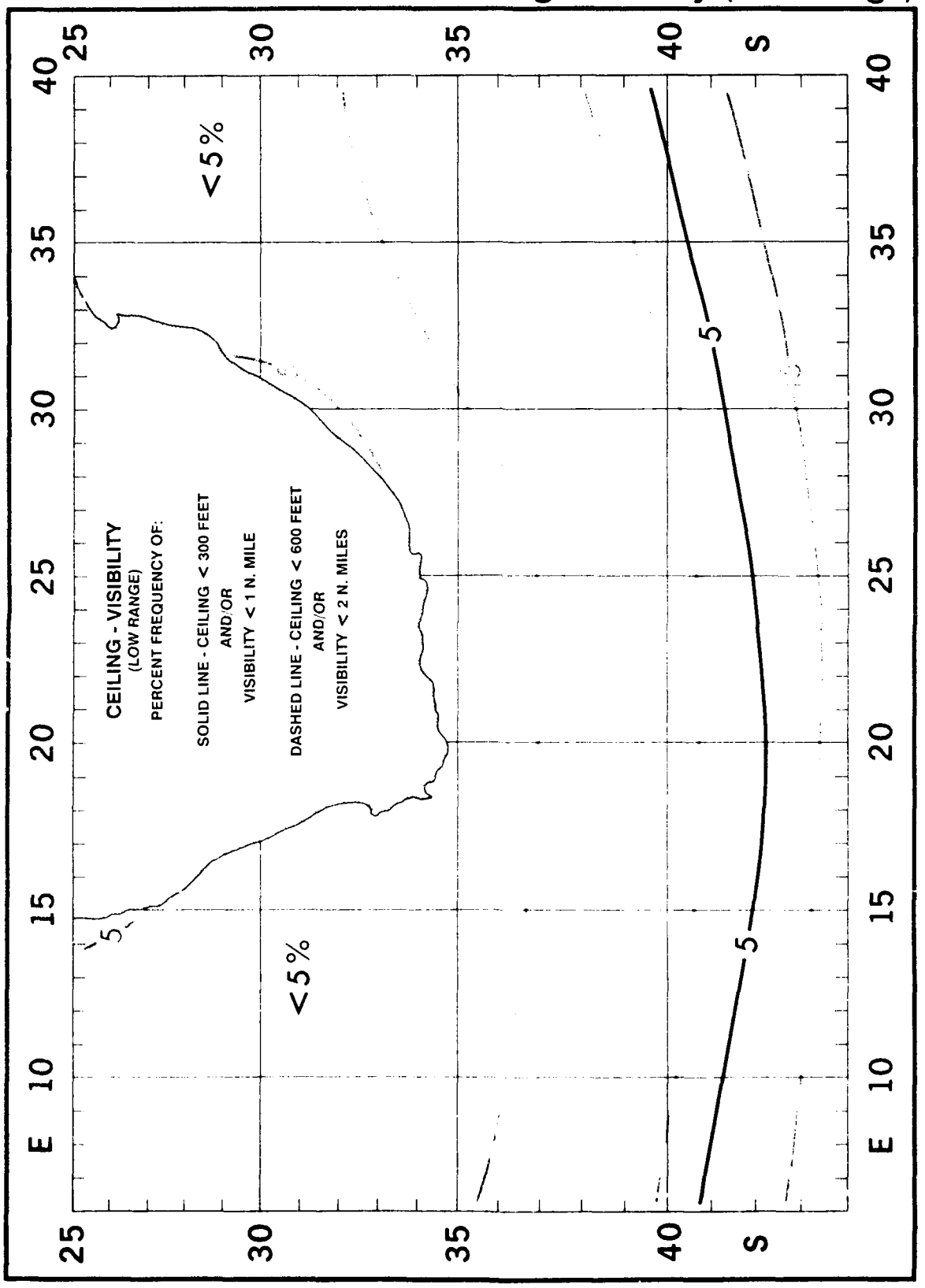


November

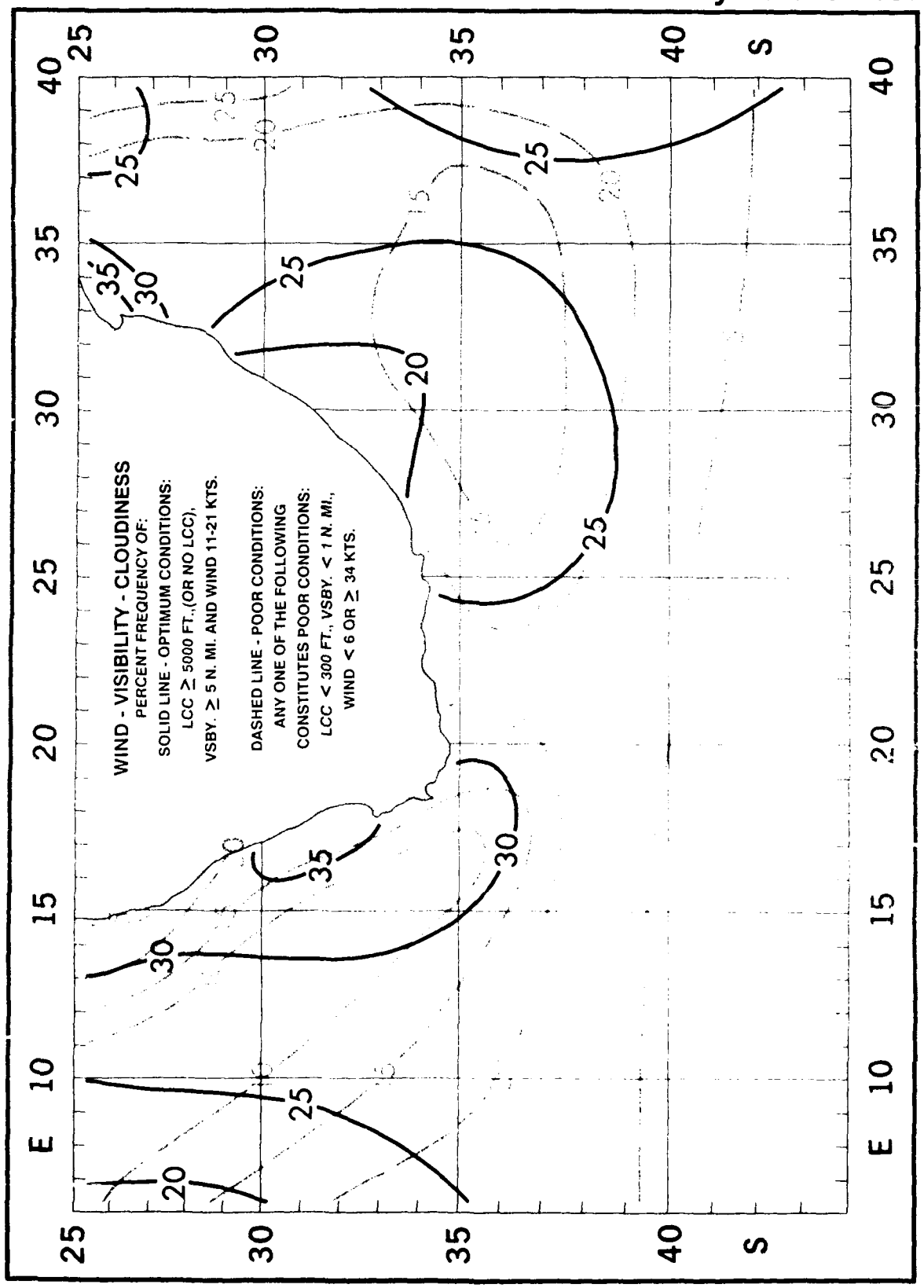
Ceiling - Visibility (Mid Range)



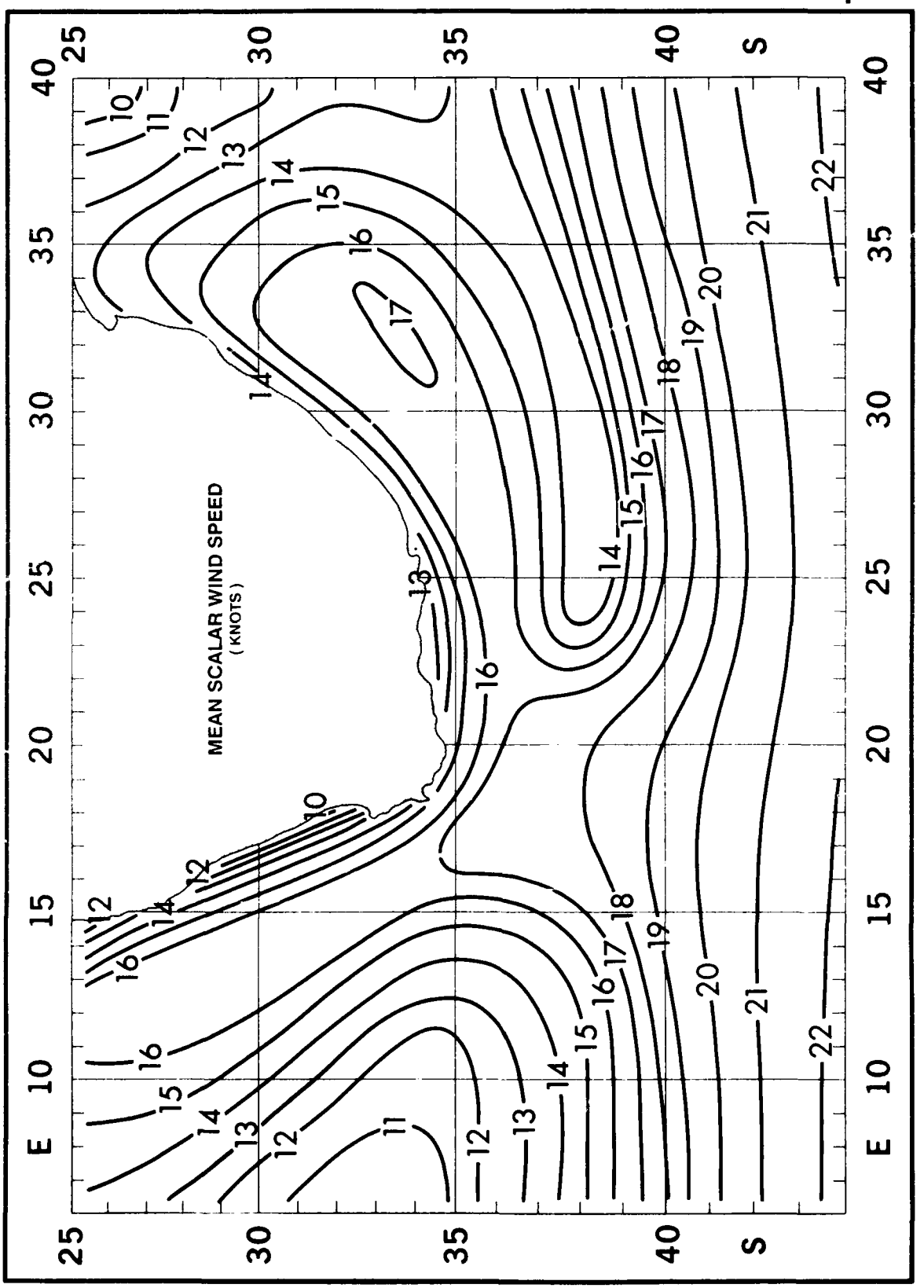
November **Ceiling - Visibility (Low Range)**

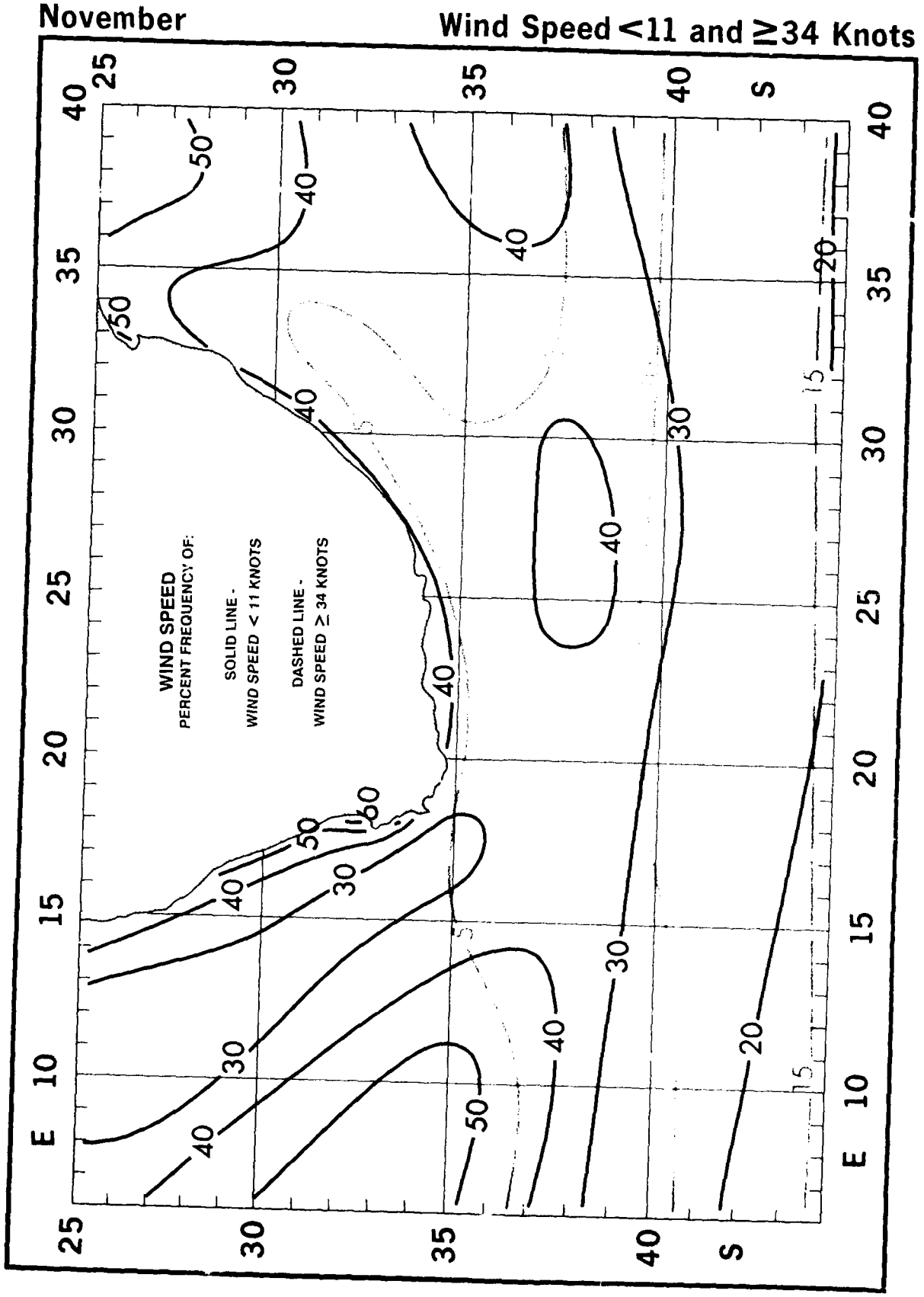


November **Wind - Visibility - Cloudiness**



November **Mean Scalar Wind Speed**




November
Wind Speed <11 and ≥34 Knots
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED < 11 KNOTS
DASHED LINE -
WIND SPEED ≥ 34 KNOTS
25
30
35
40
S
E 10
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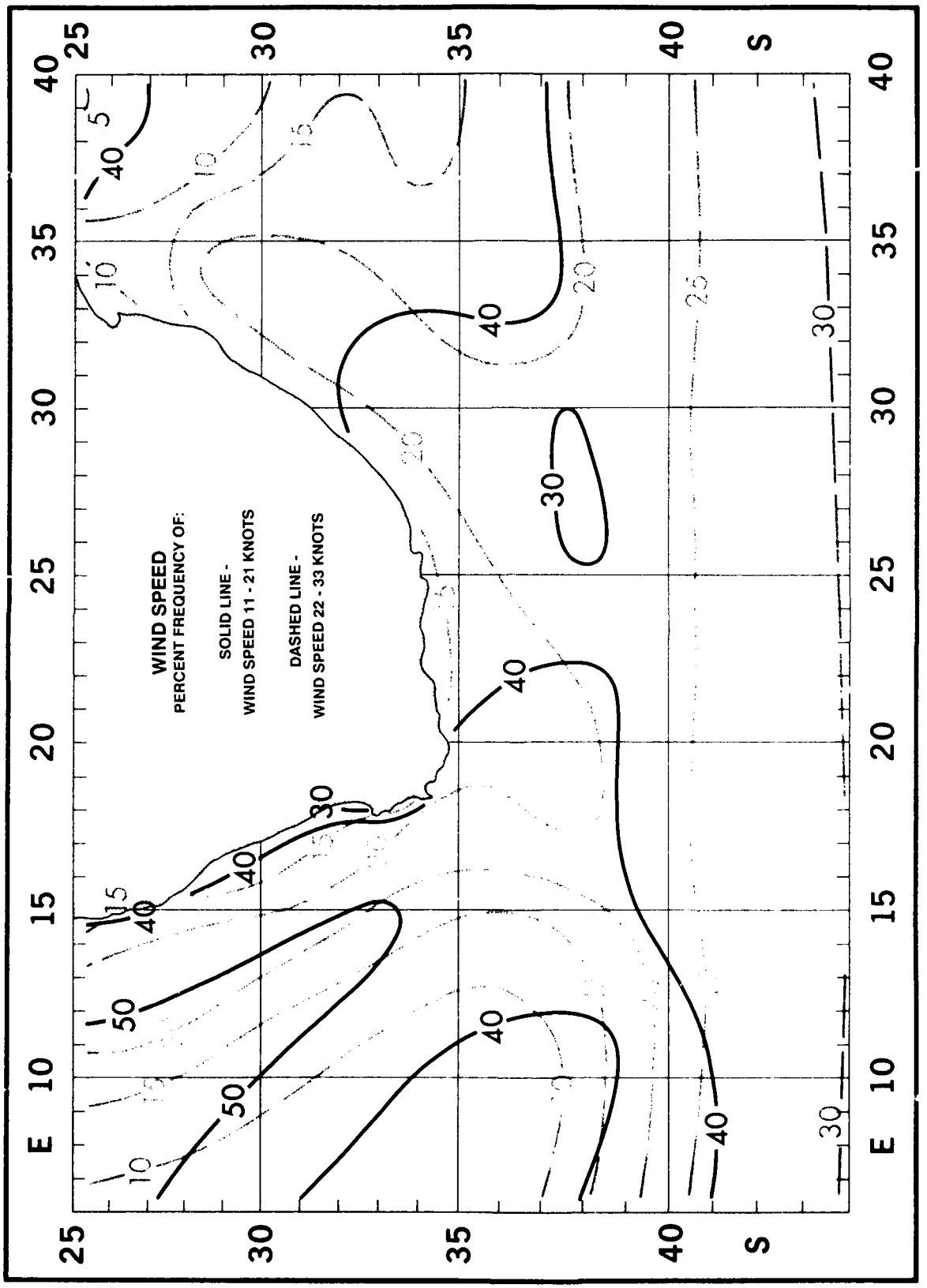
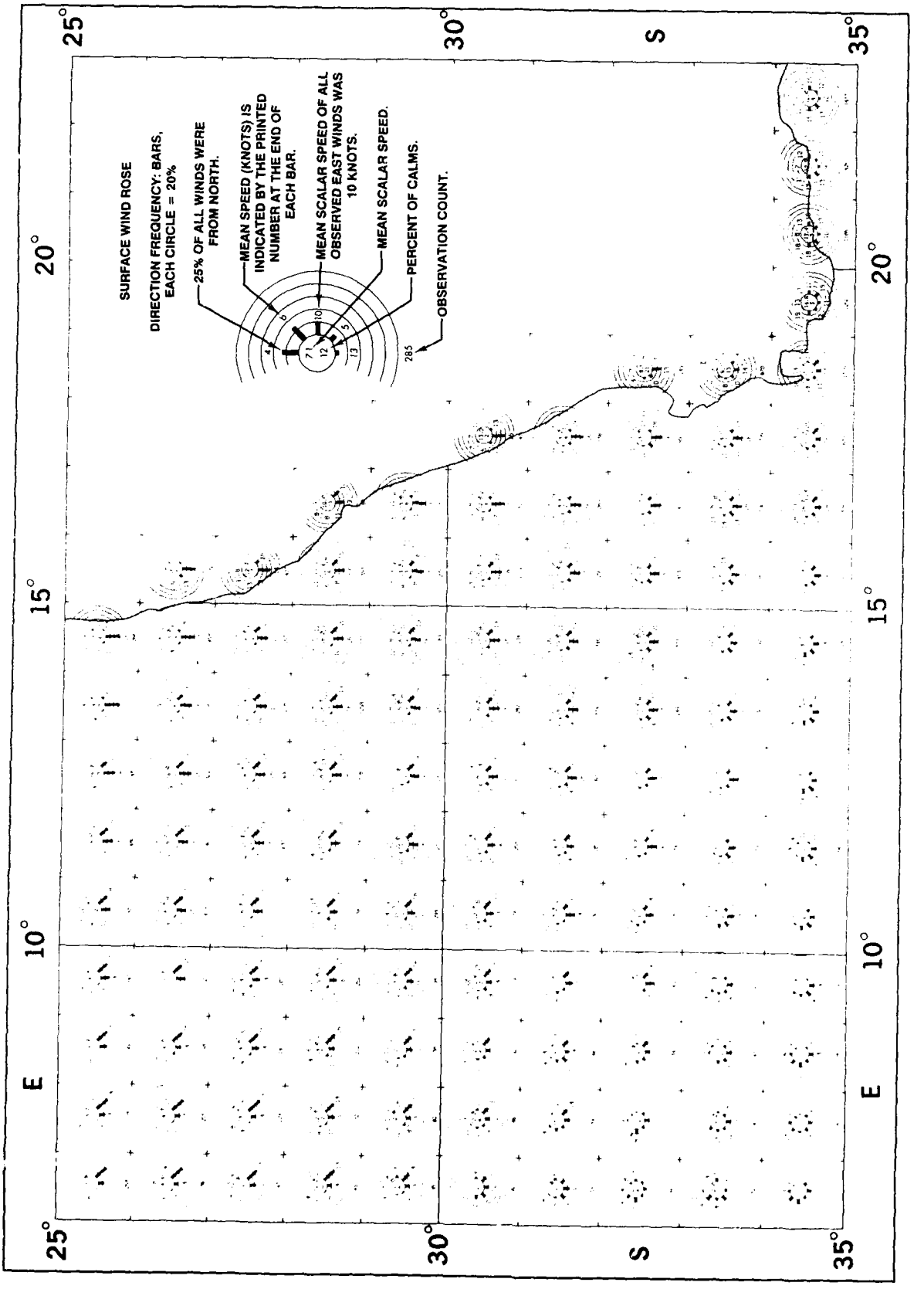
50
40
30
20
15

November **Wind Speed 11 - 21 and 22 - 33 Knots**



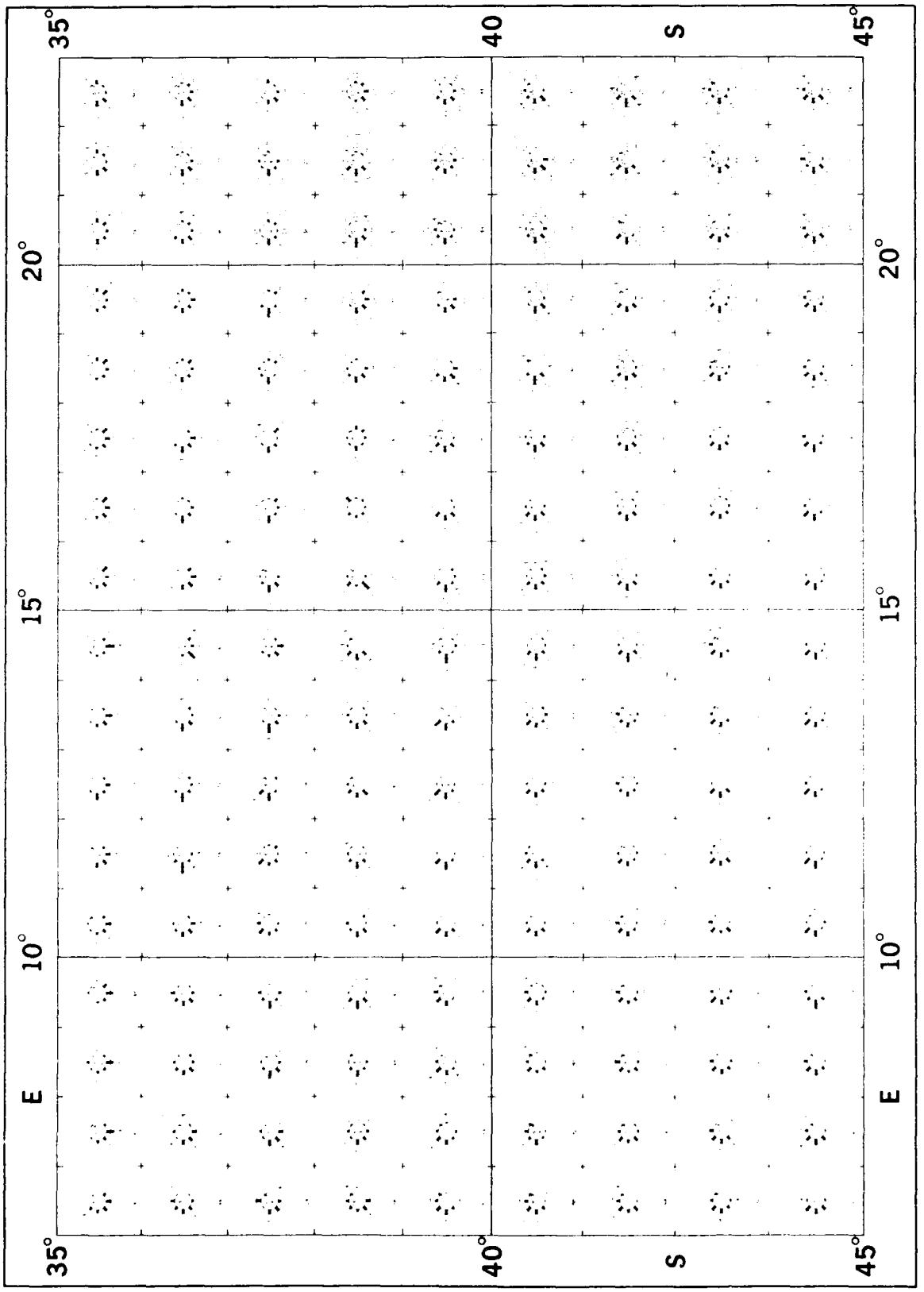
November

Surface Wind Roses



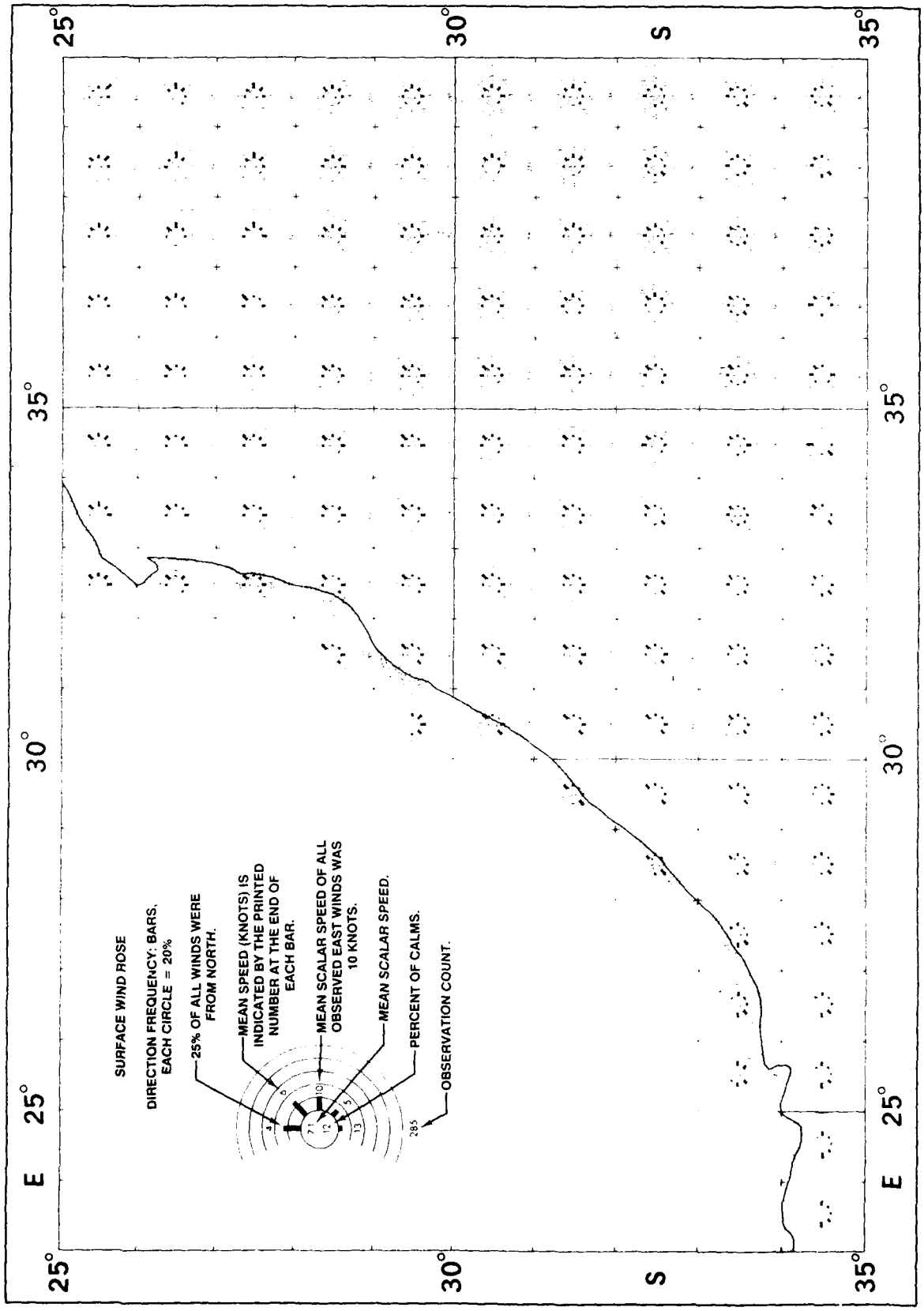
November

Surface Wind Roses



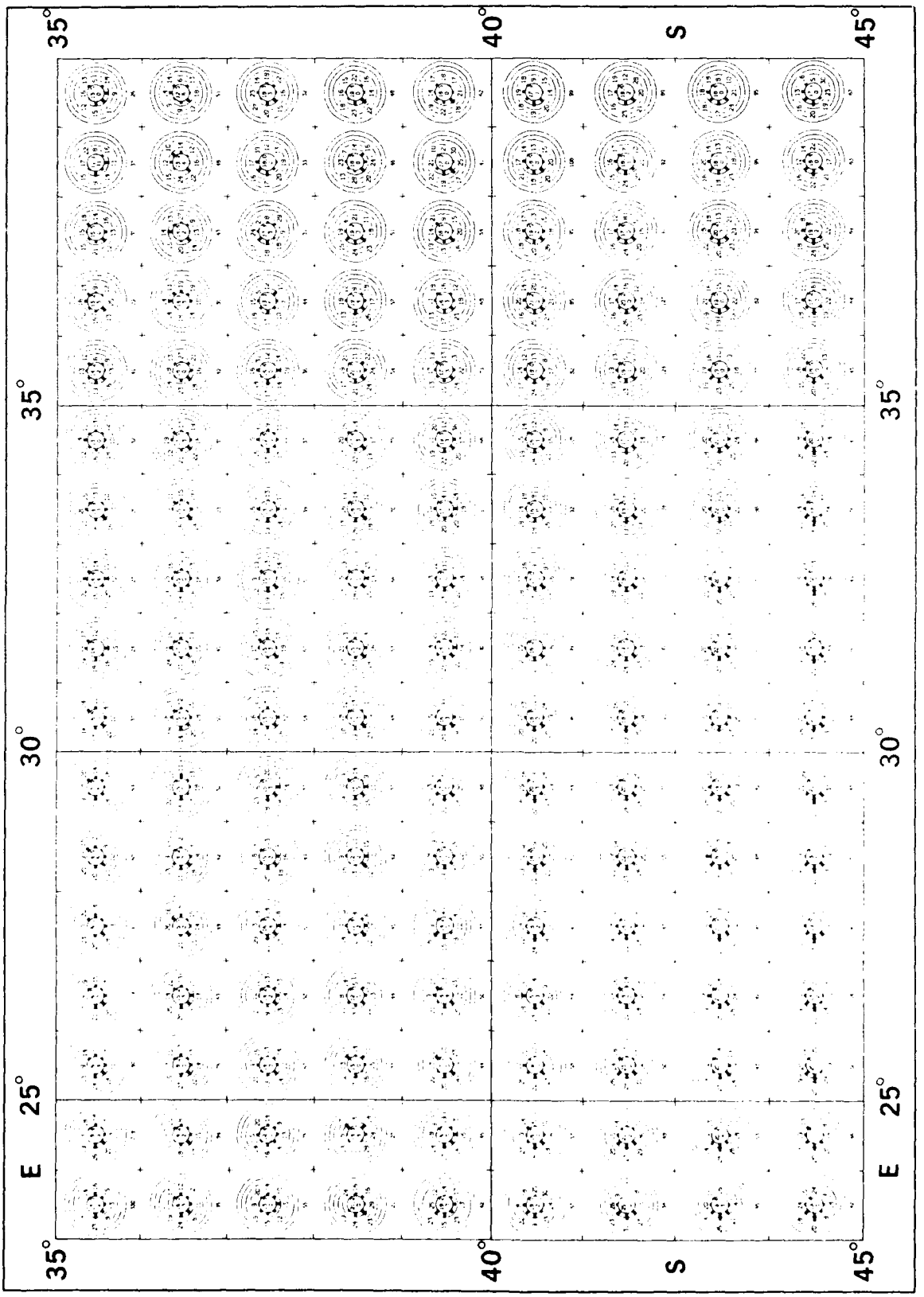
November

Surface Wind Roses

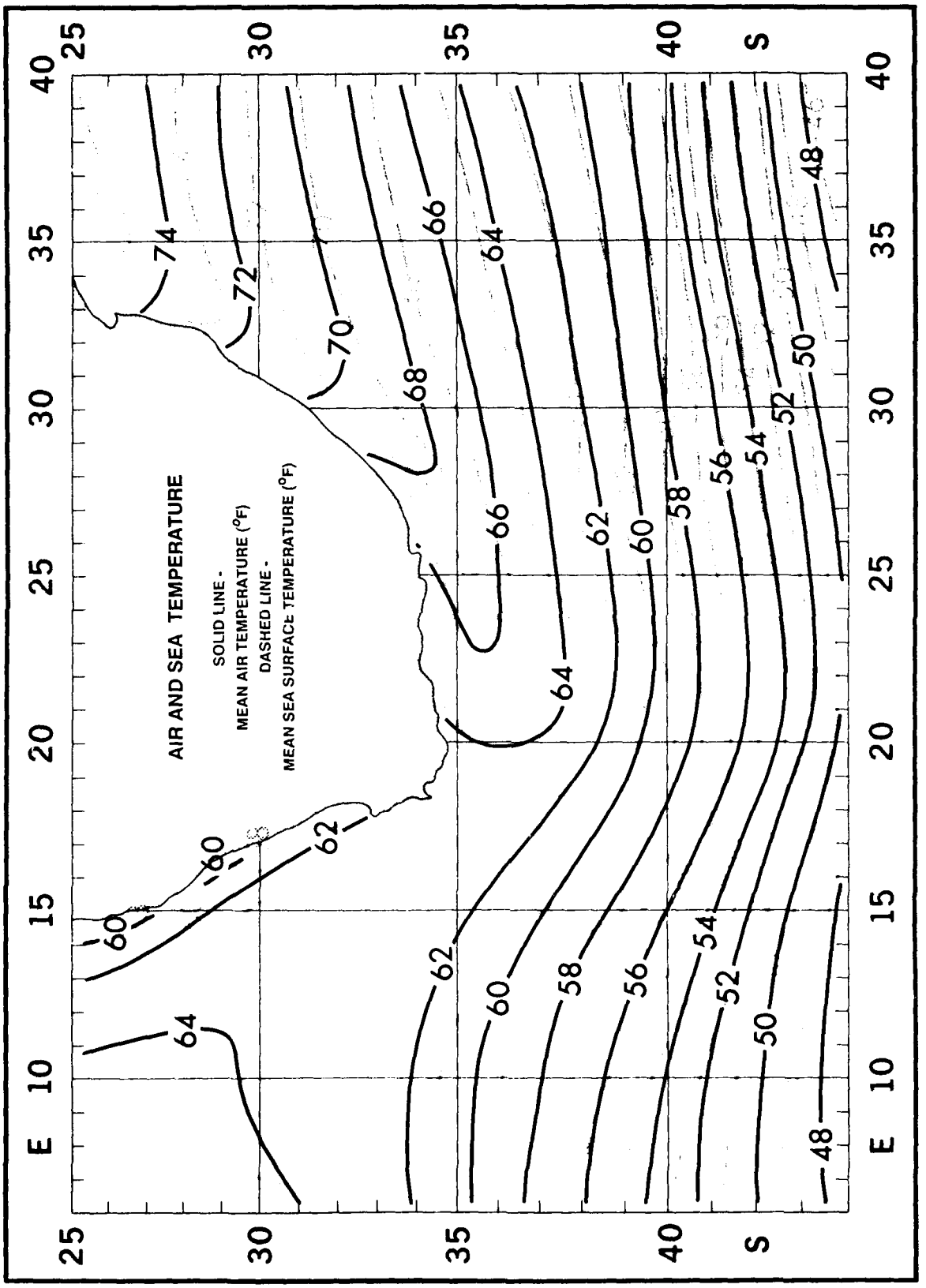


November

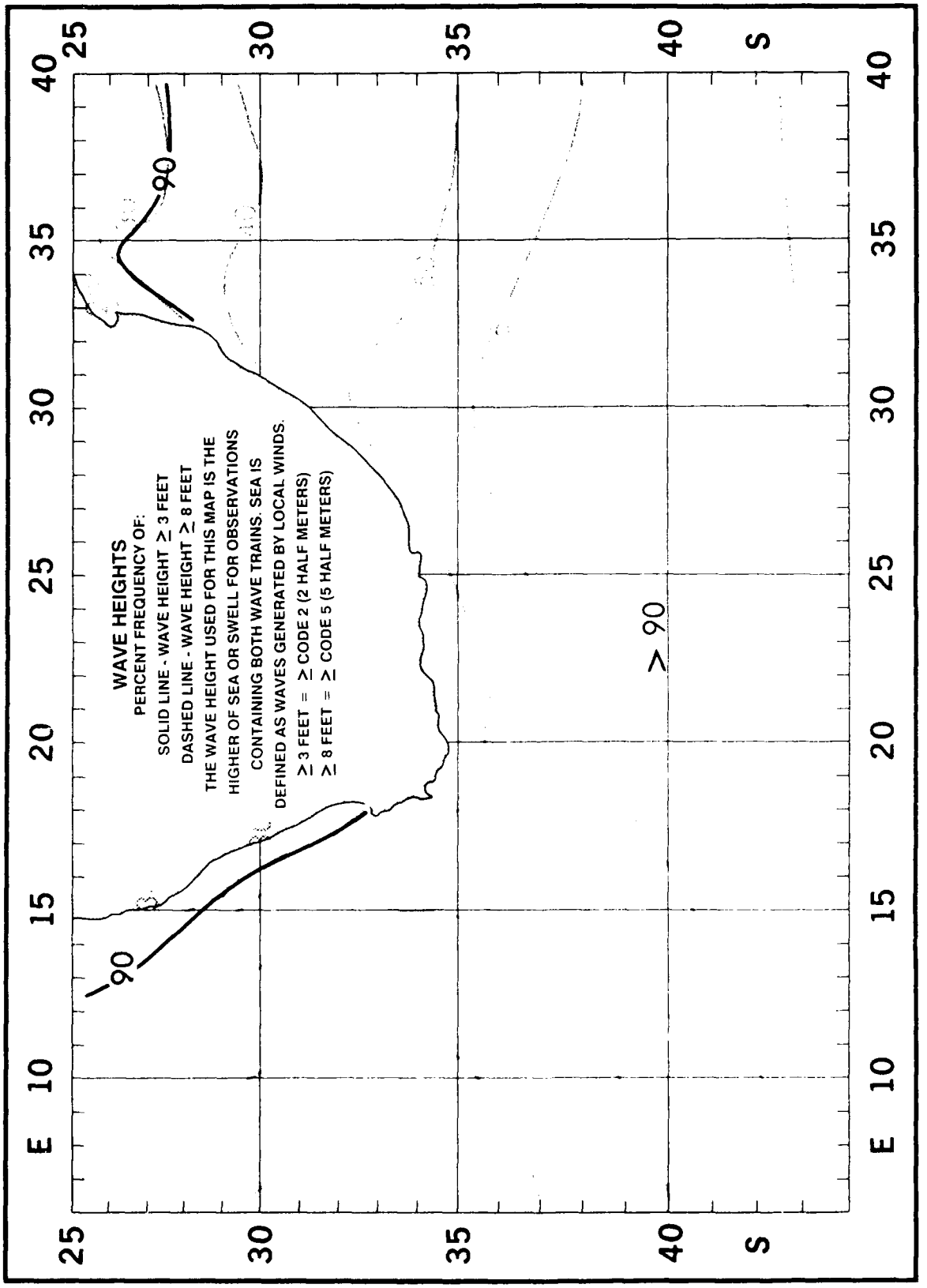
Surface Wind Roses



November **Air and Sea Temperature**

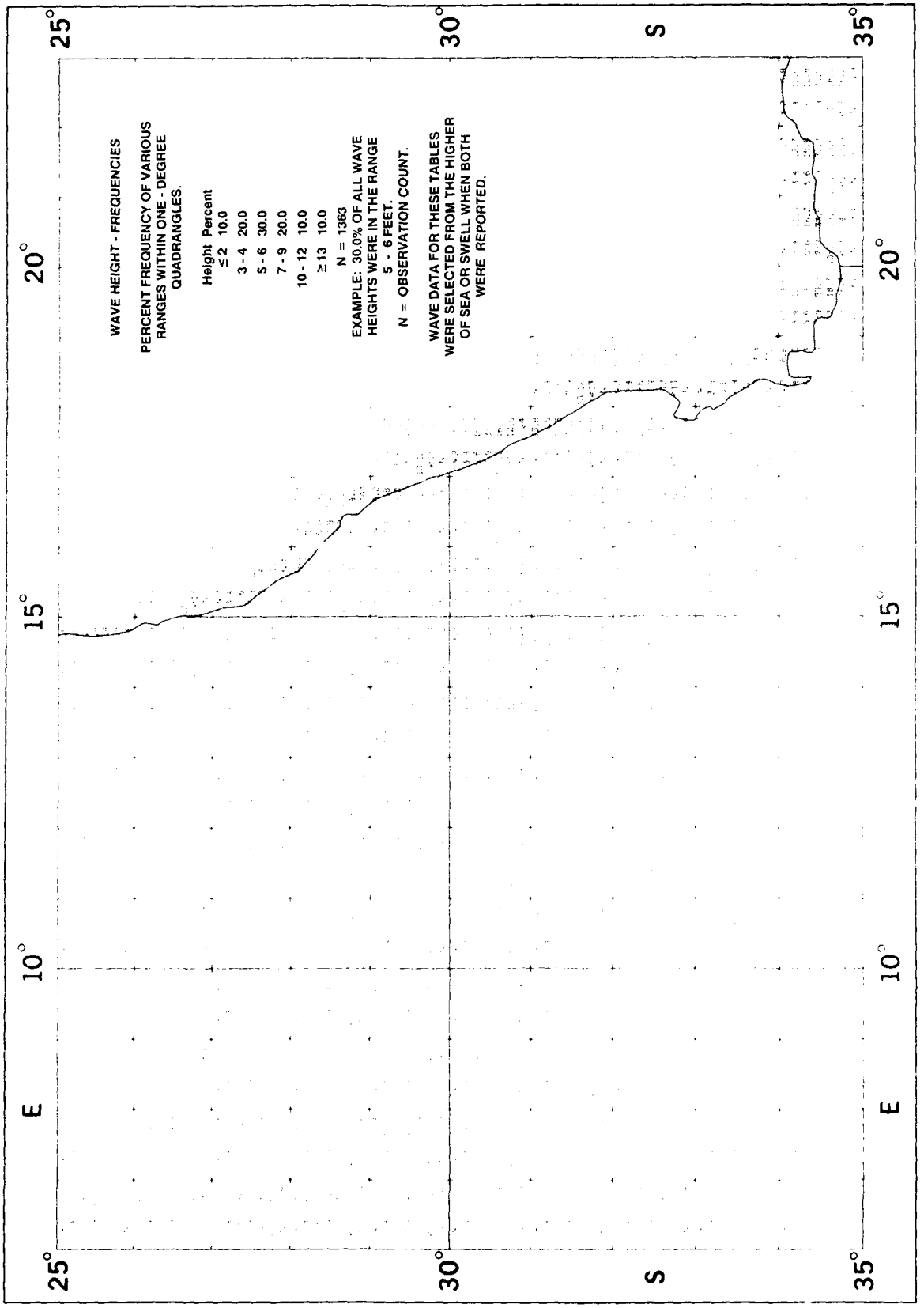


November **Wave Height**

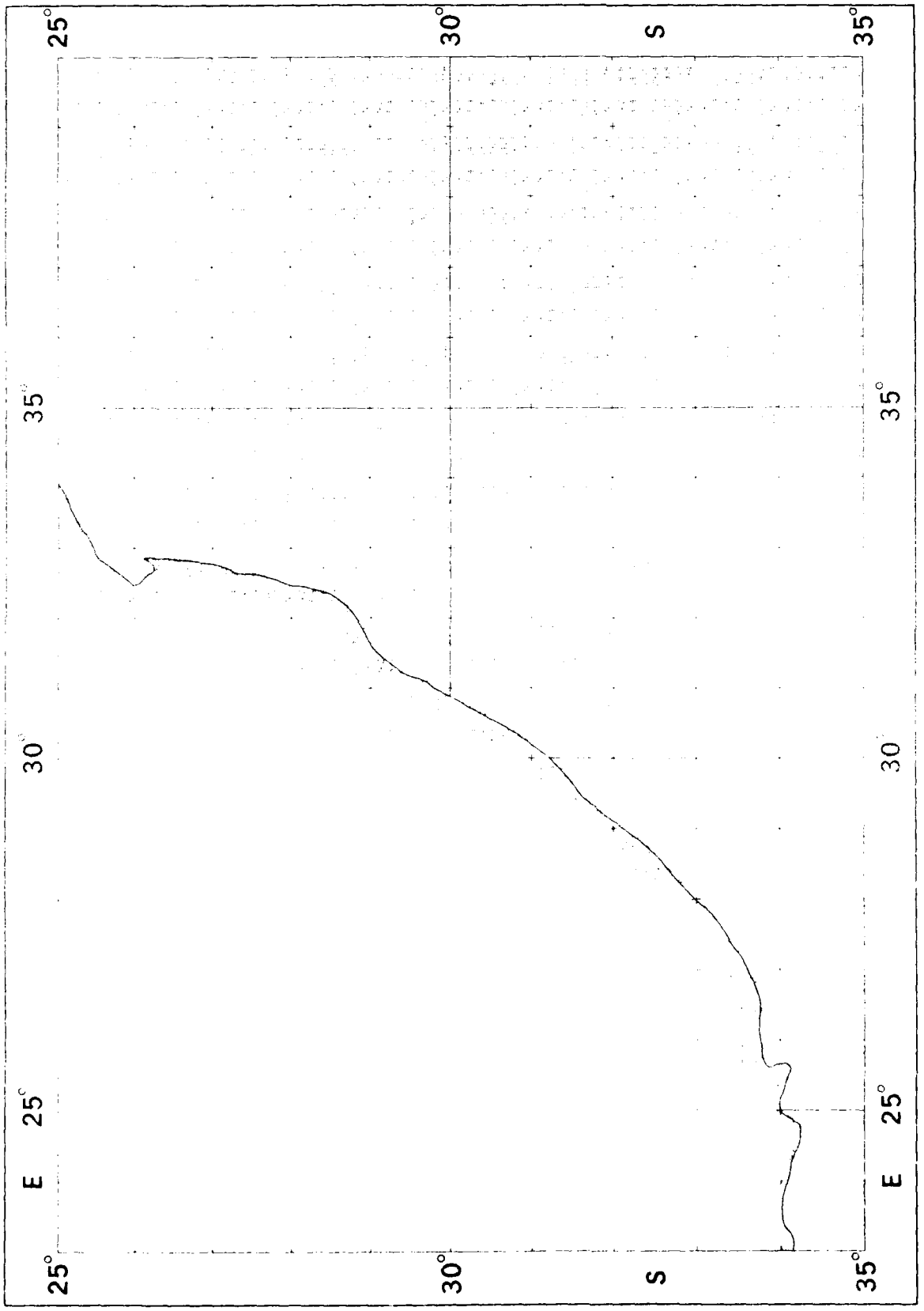


November

Wave Height

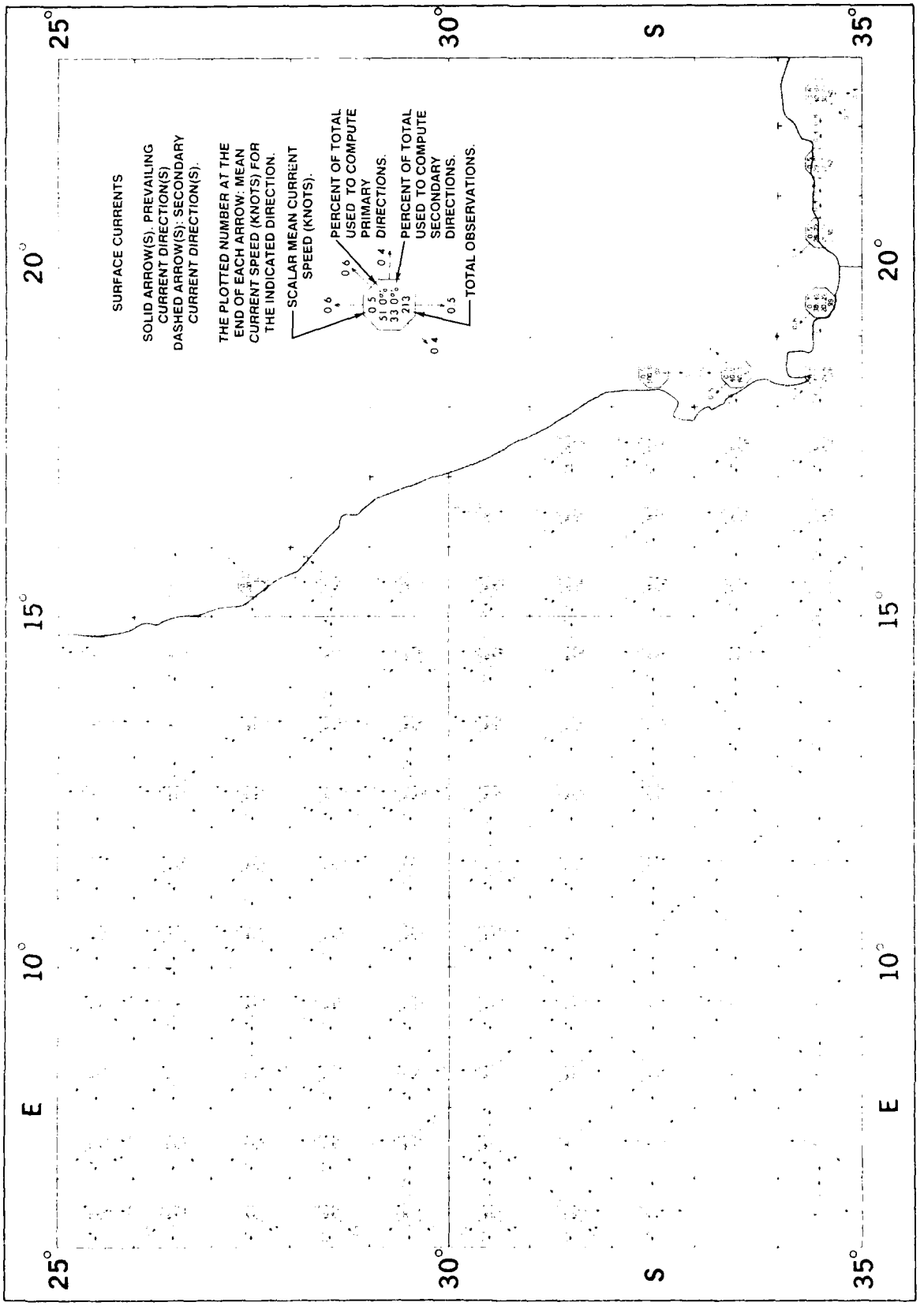


November **Wave Height**



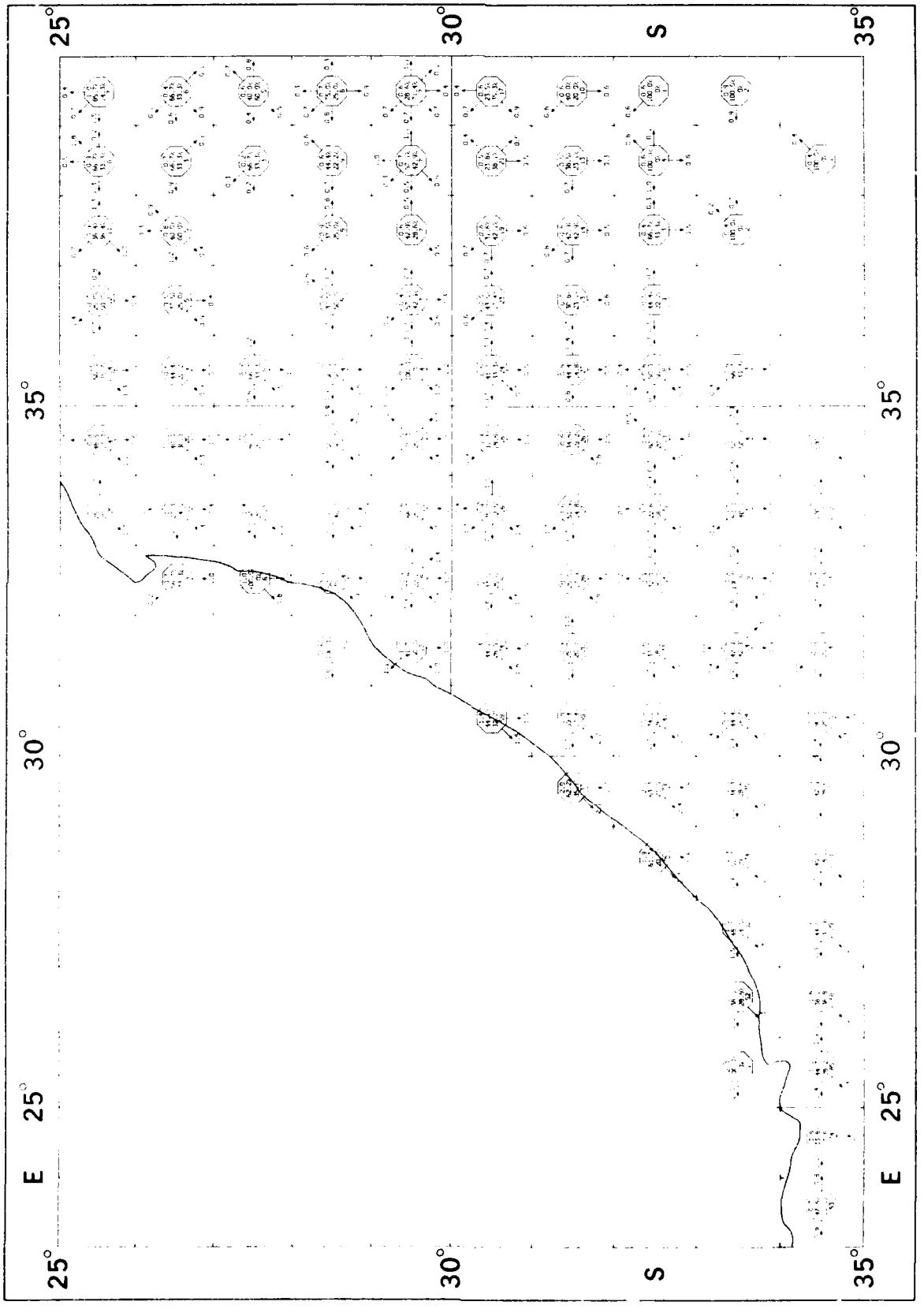
November

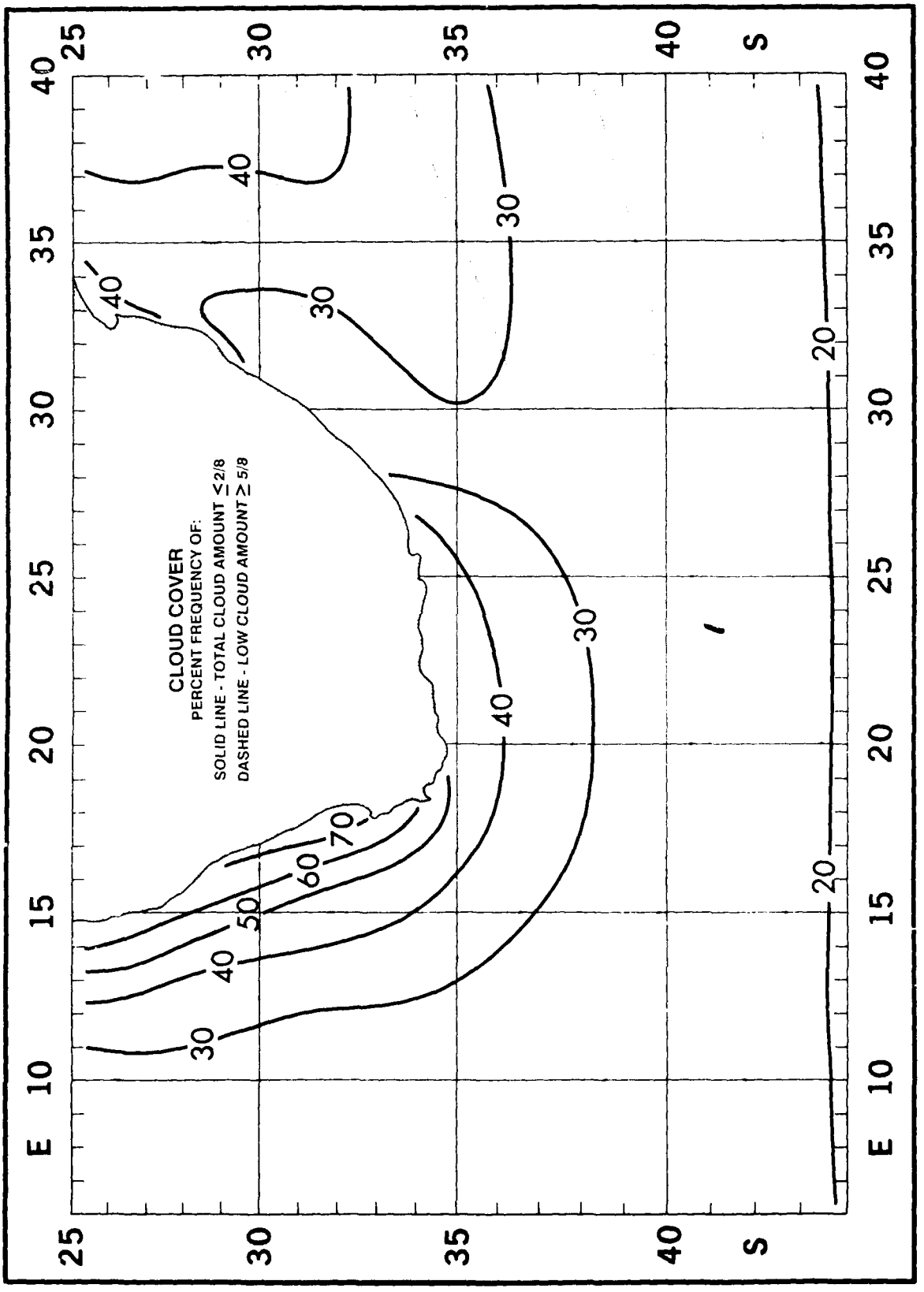
Surface Currents



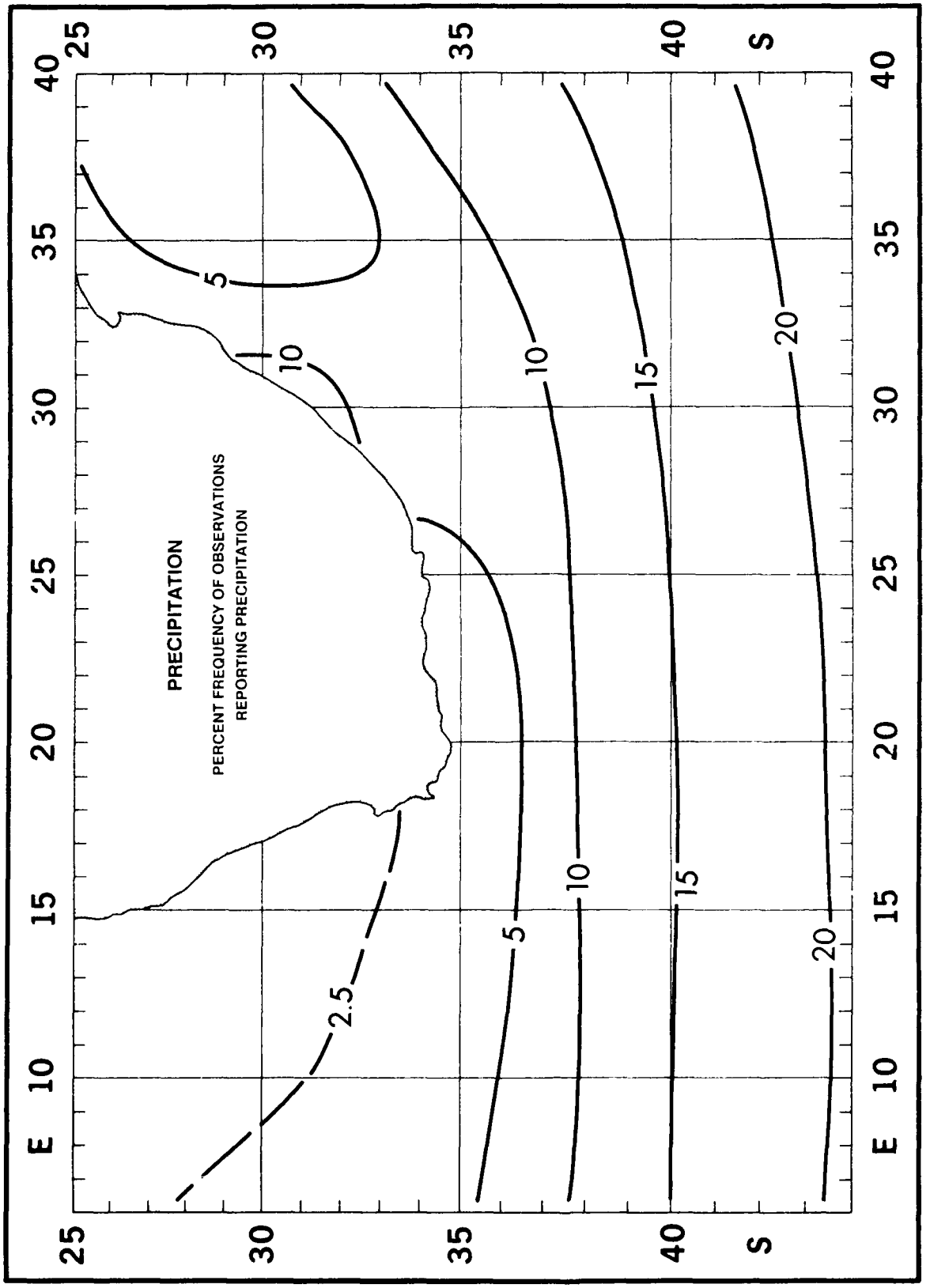
November

Surface Currents

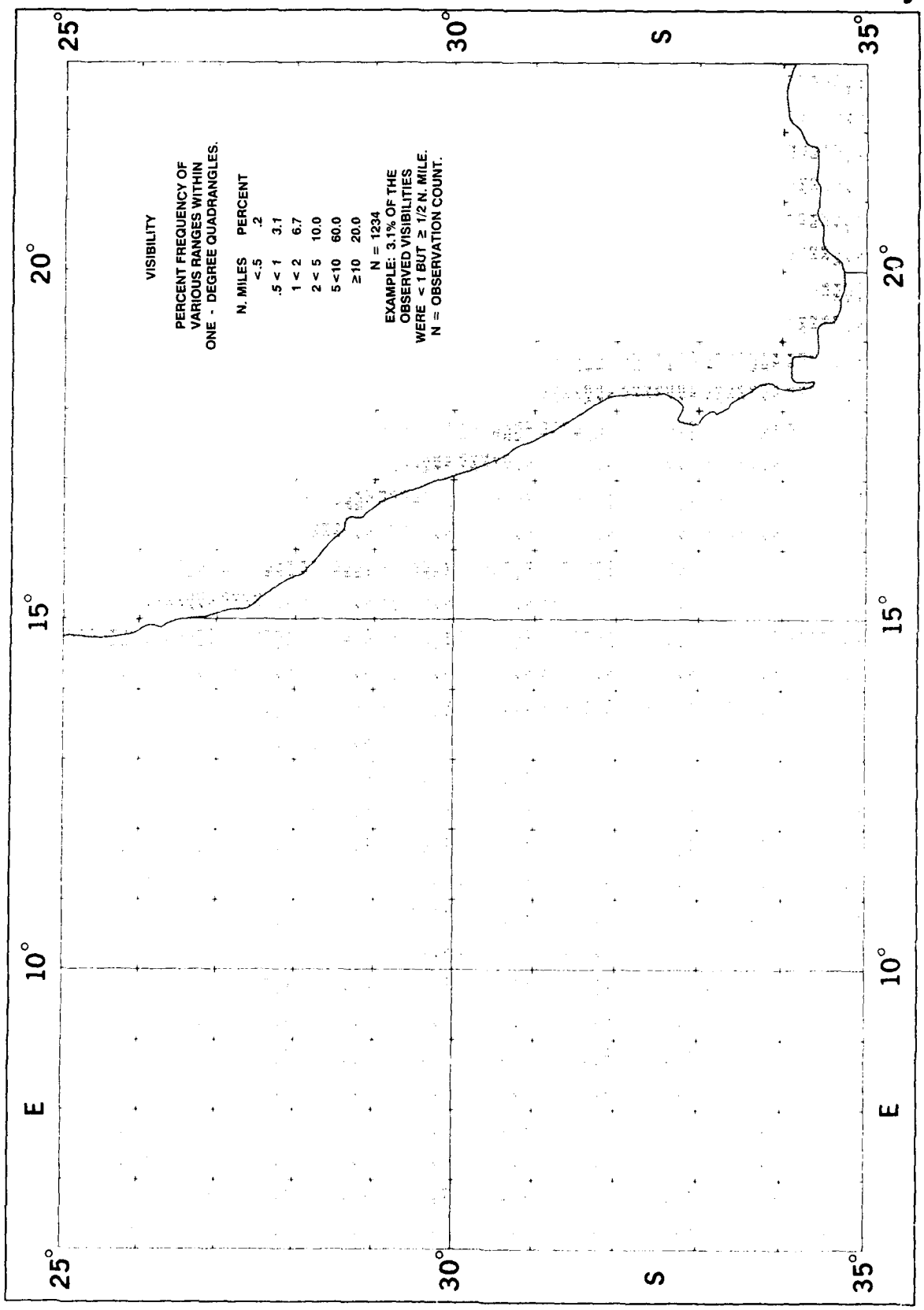



CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE - TOTAL CLOUD AMOUNT ≤ 2/8
DASHED LINE - LOW CLOUD AMOUNT ≥ 5/8
25
30
35
40
S
E 10
15
20
25
30
35
40
70
60
50
40
30
20

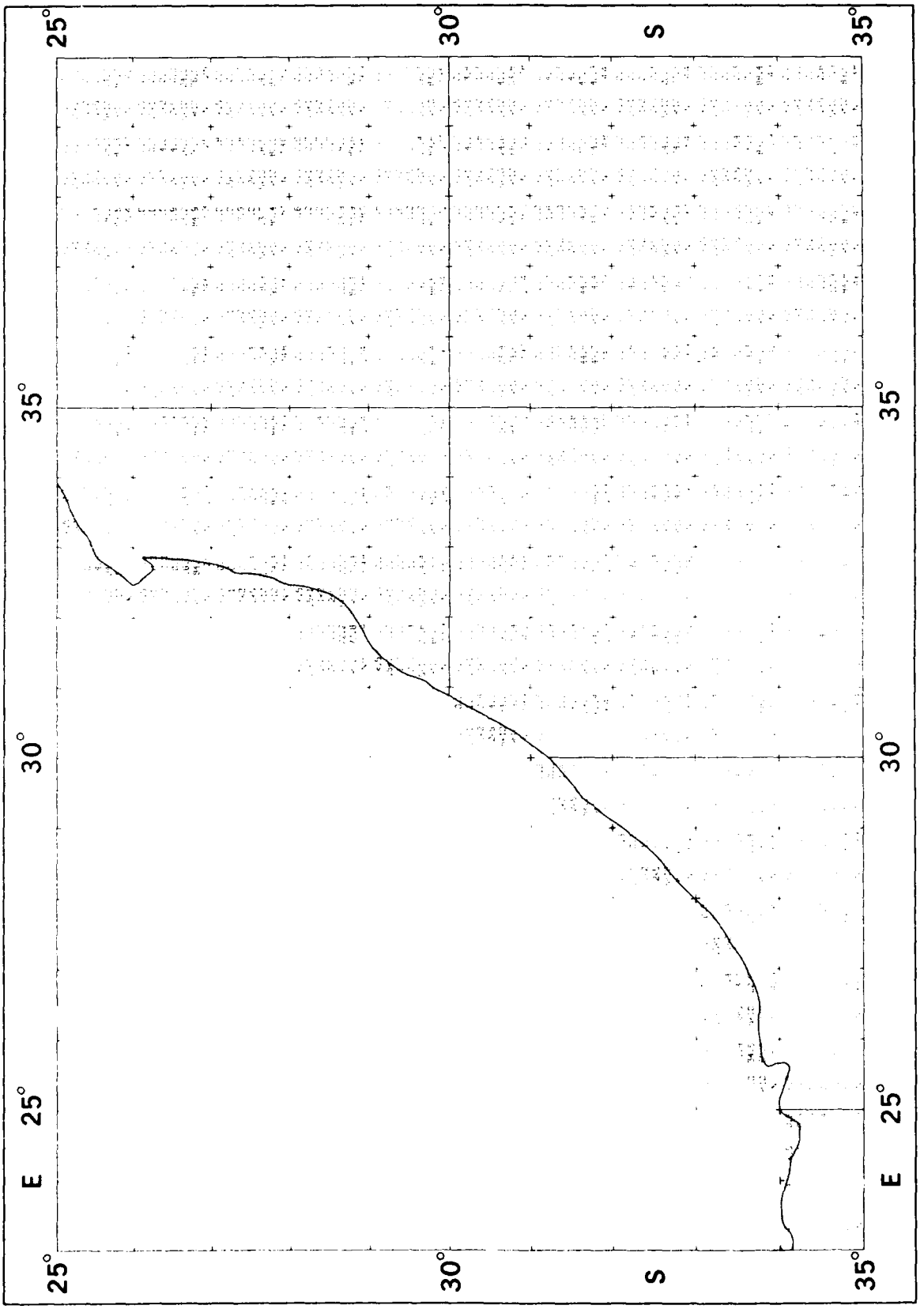
December **Precipitation**



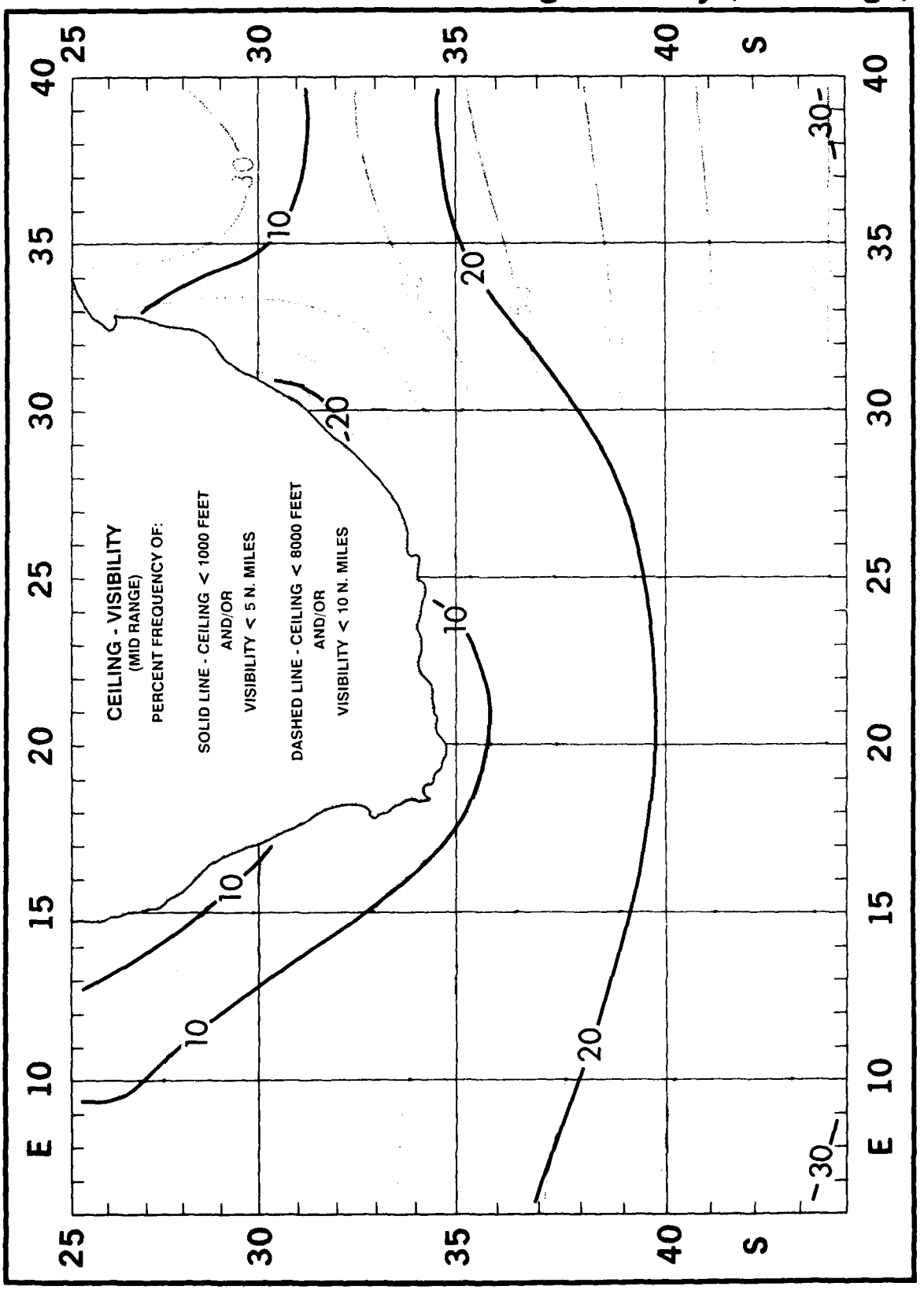
December Visibility



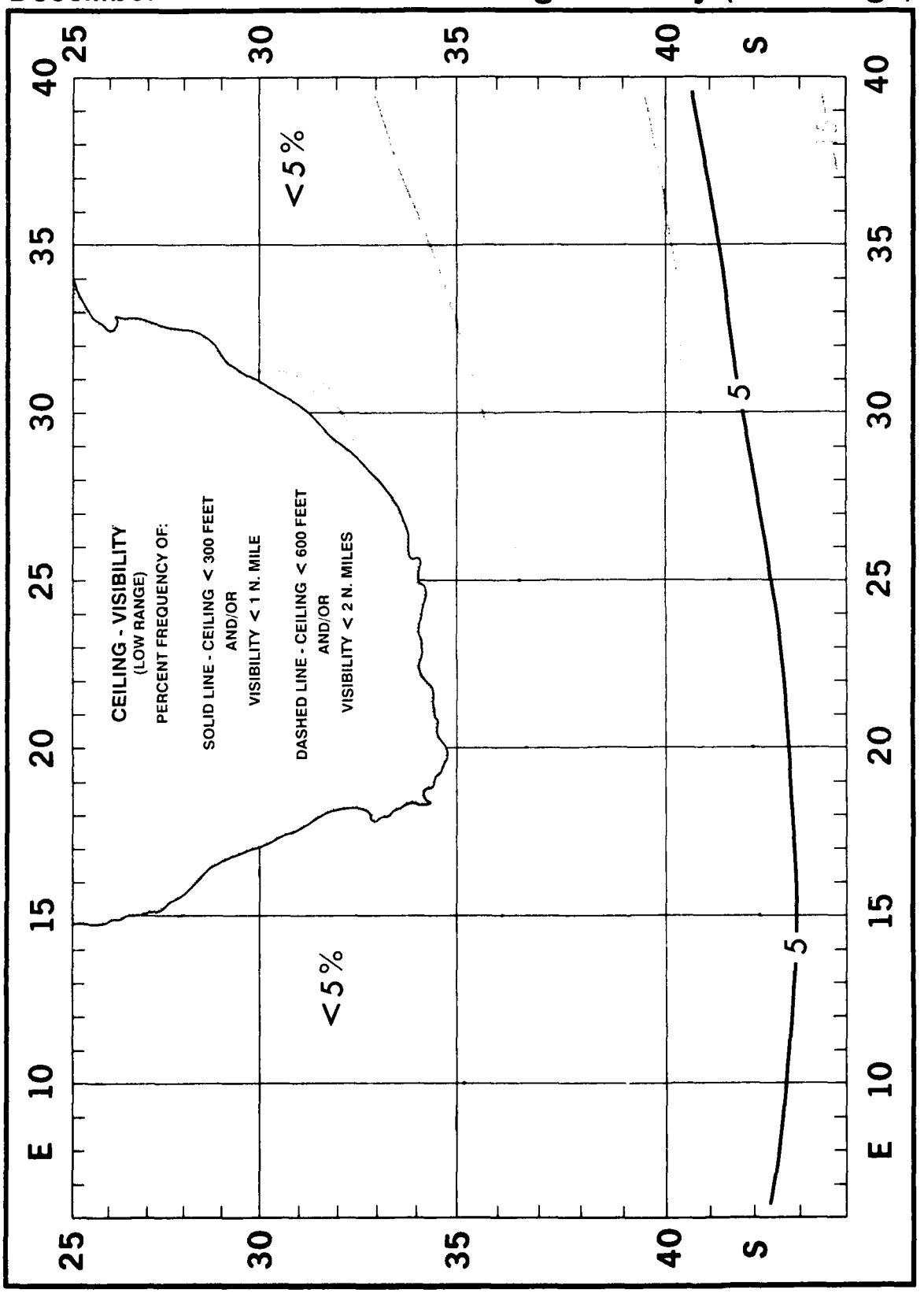
December **Visibility**



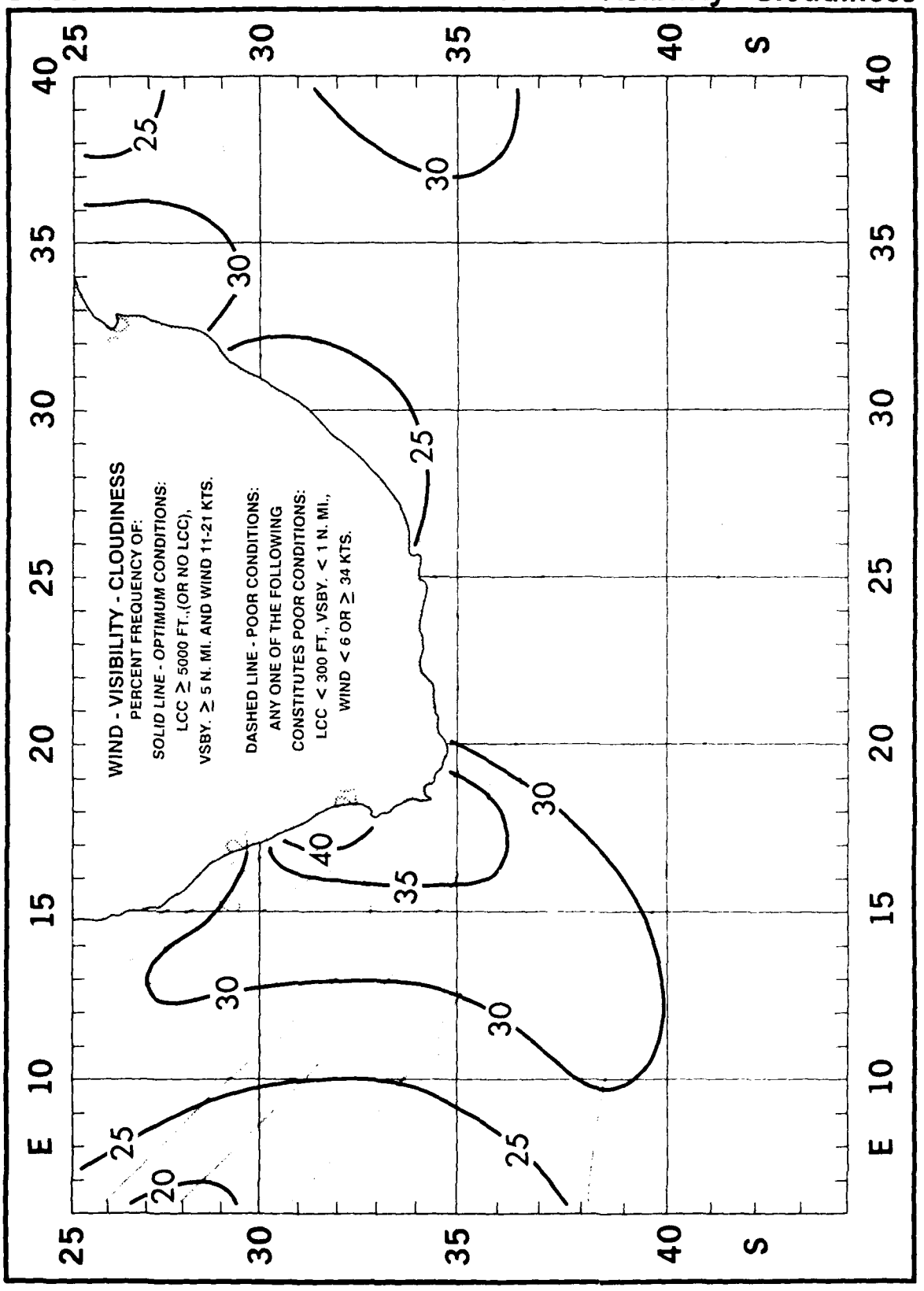
December **Ceiling - Visibility (Mid Range)**



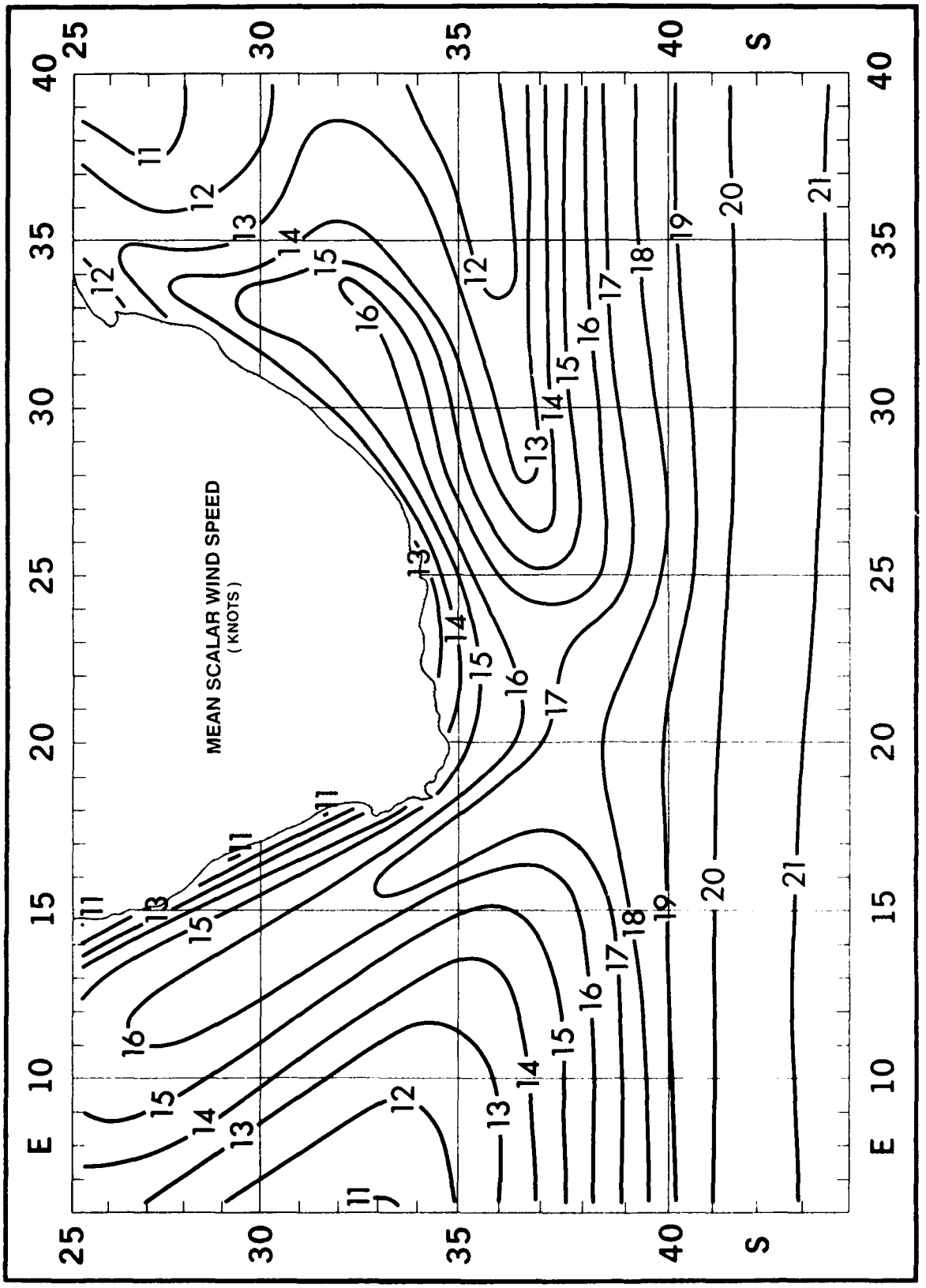
December **Ceiling - Visibility (Low Range)**



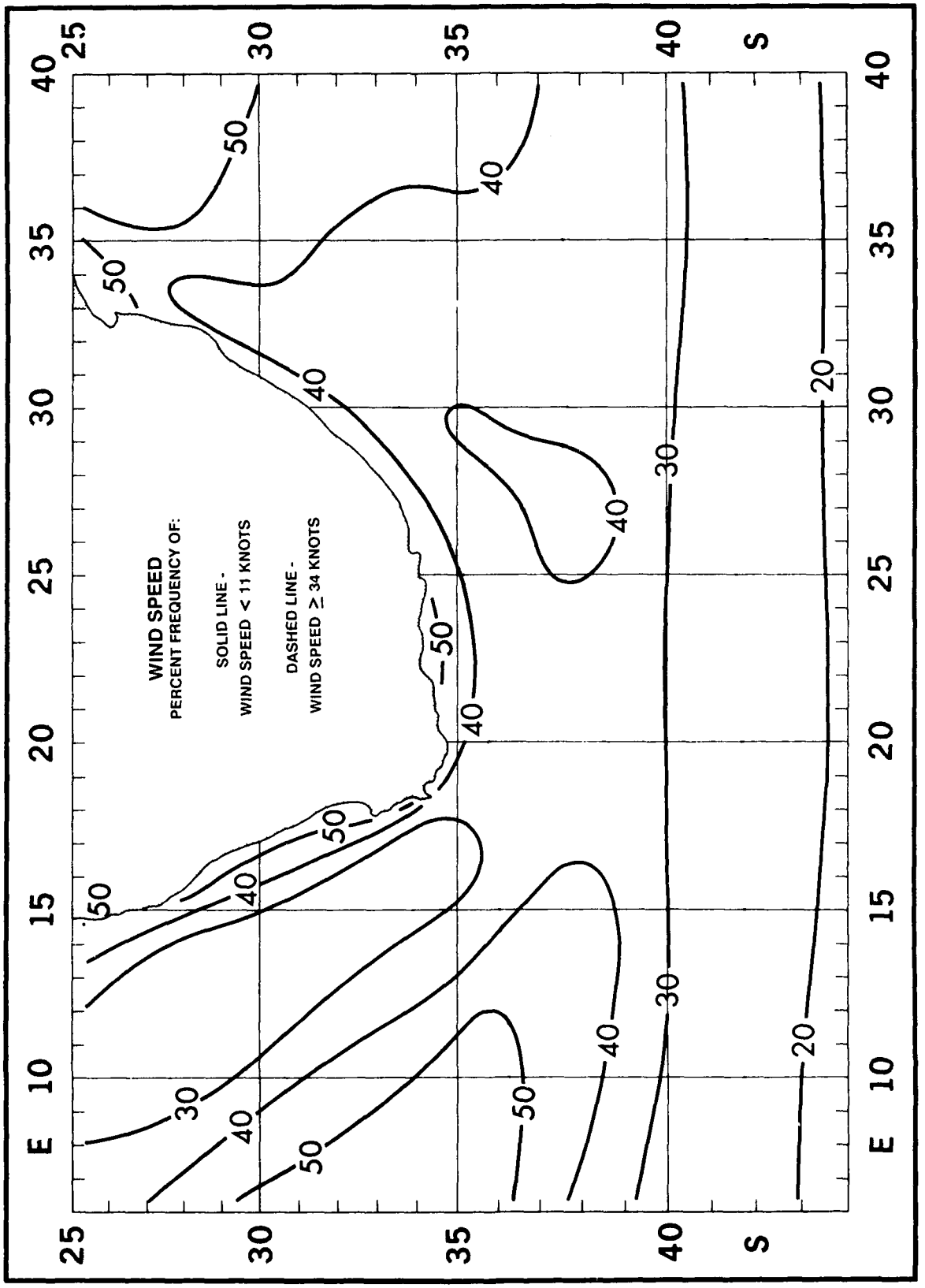
December **Wind - Visibility - Cloudiness**



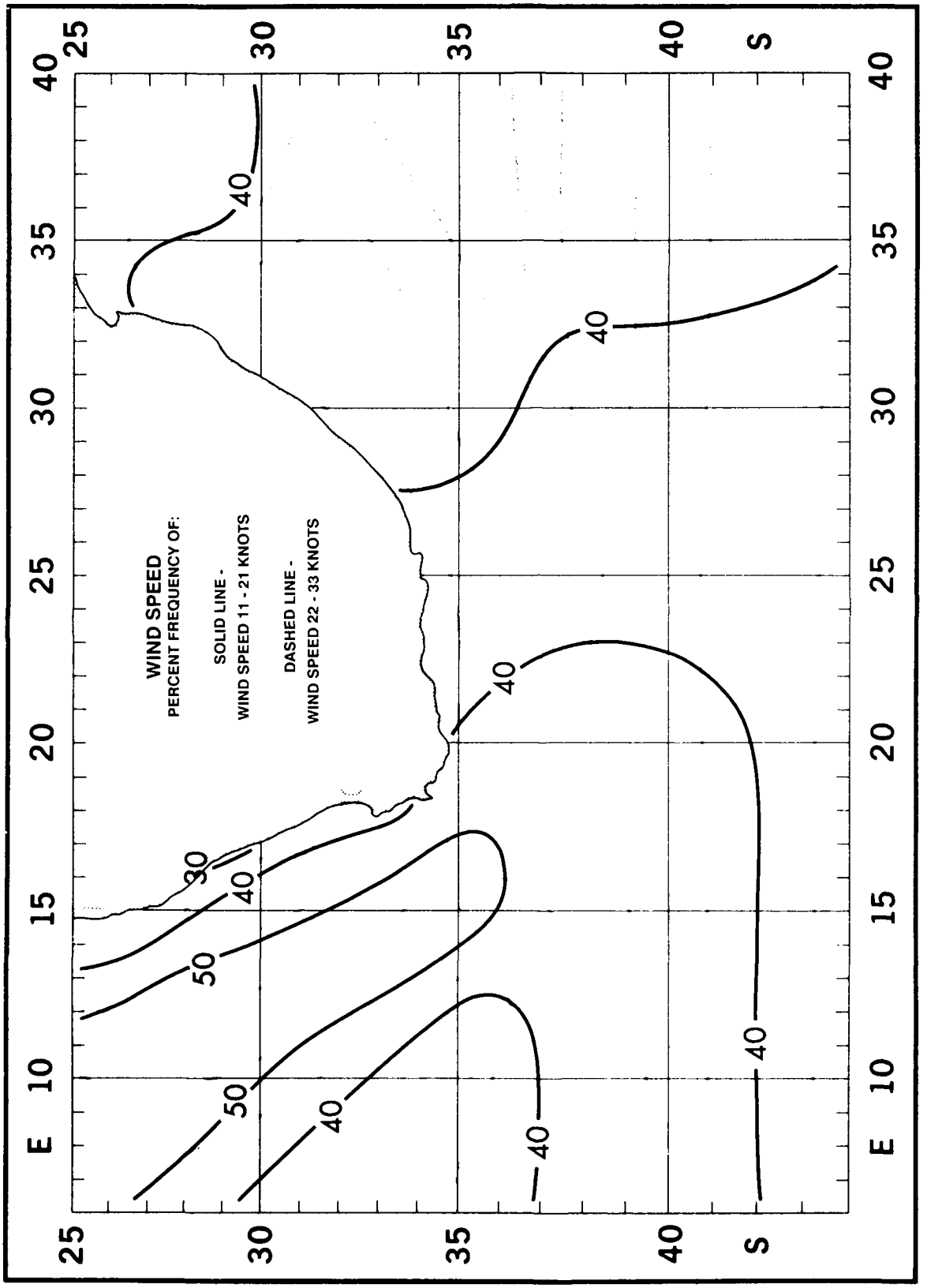
December **Mean Scalar Wind Speed**



December **Wind Speed ≤11 and ≥34 Knots**

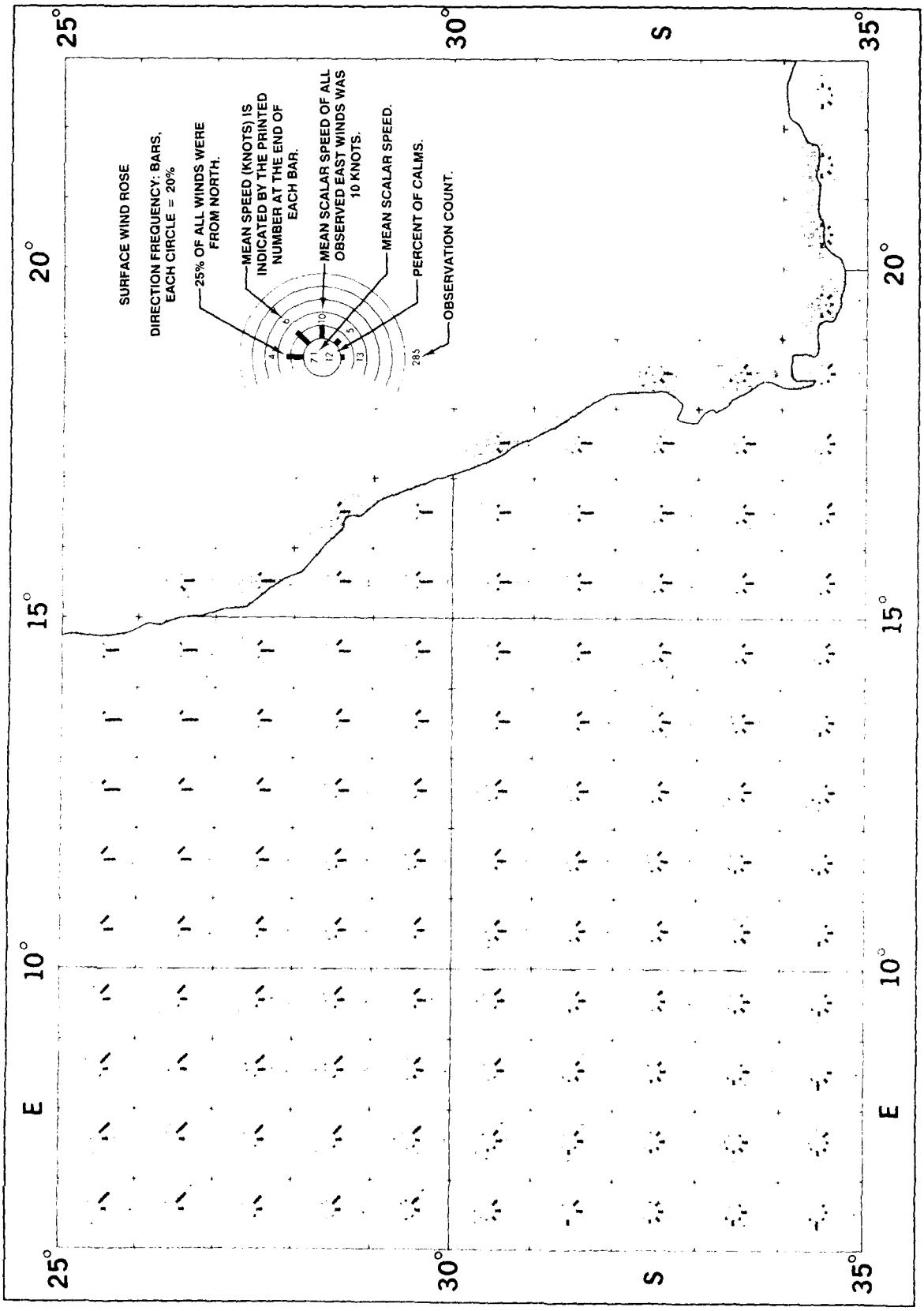


December **Wind Speed 11 - 21 and 22 - 33 Knots**



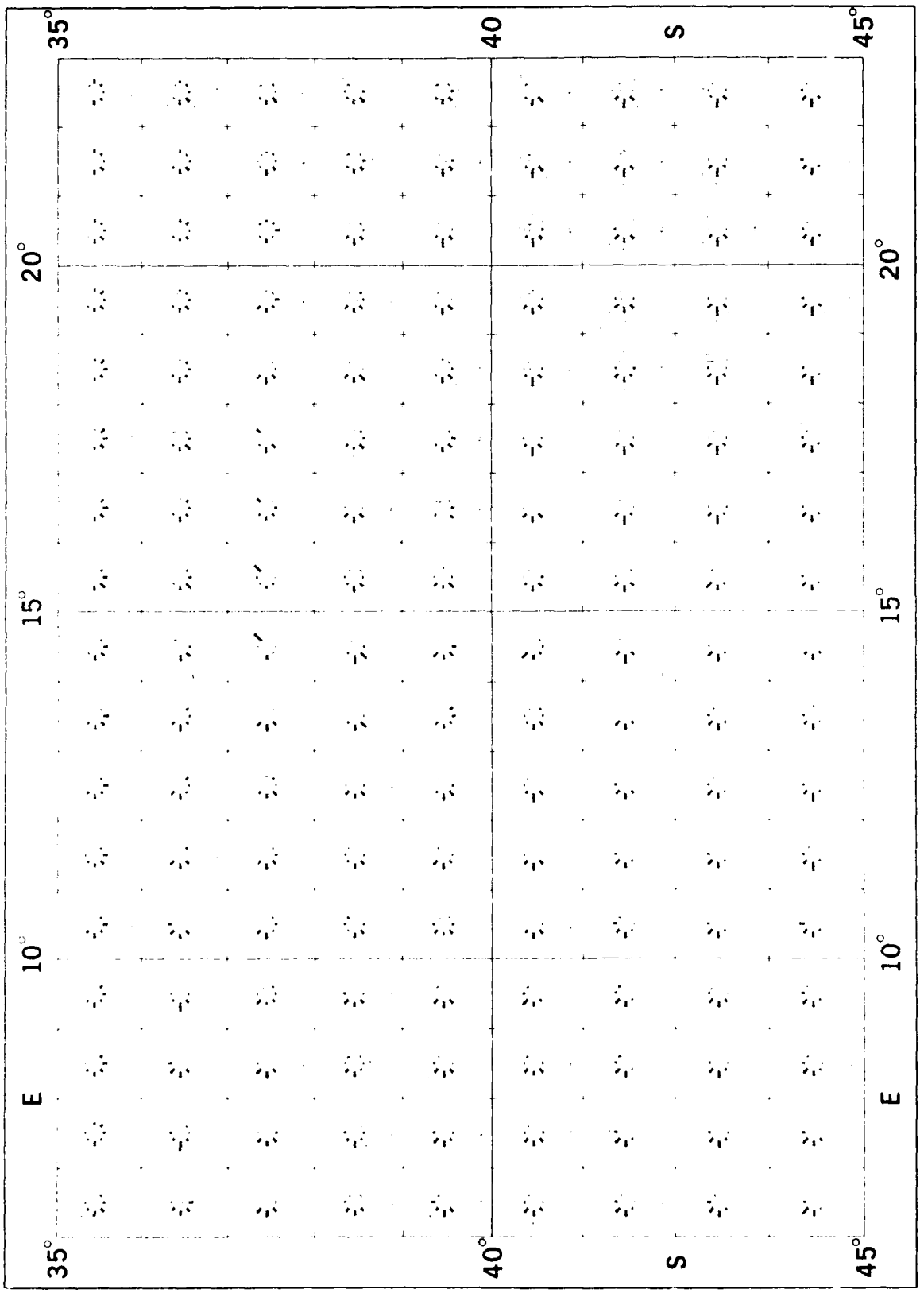
December

Surface Wind Roses



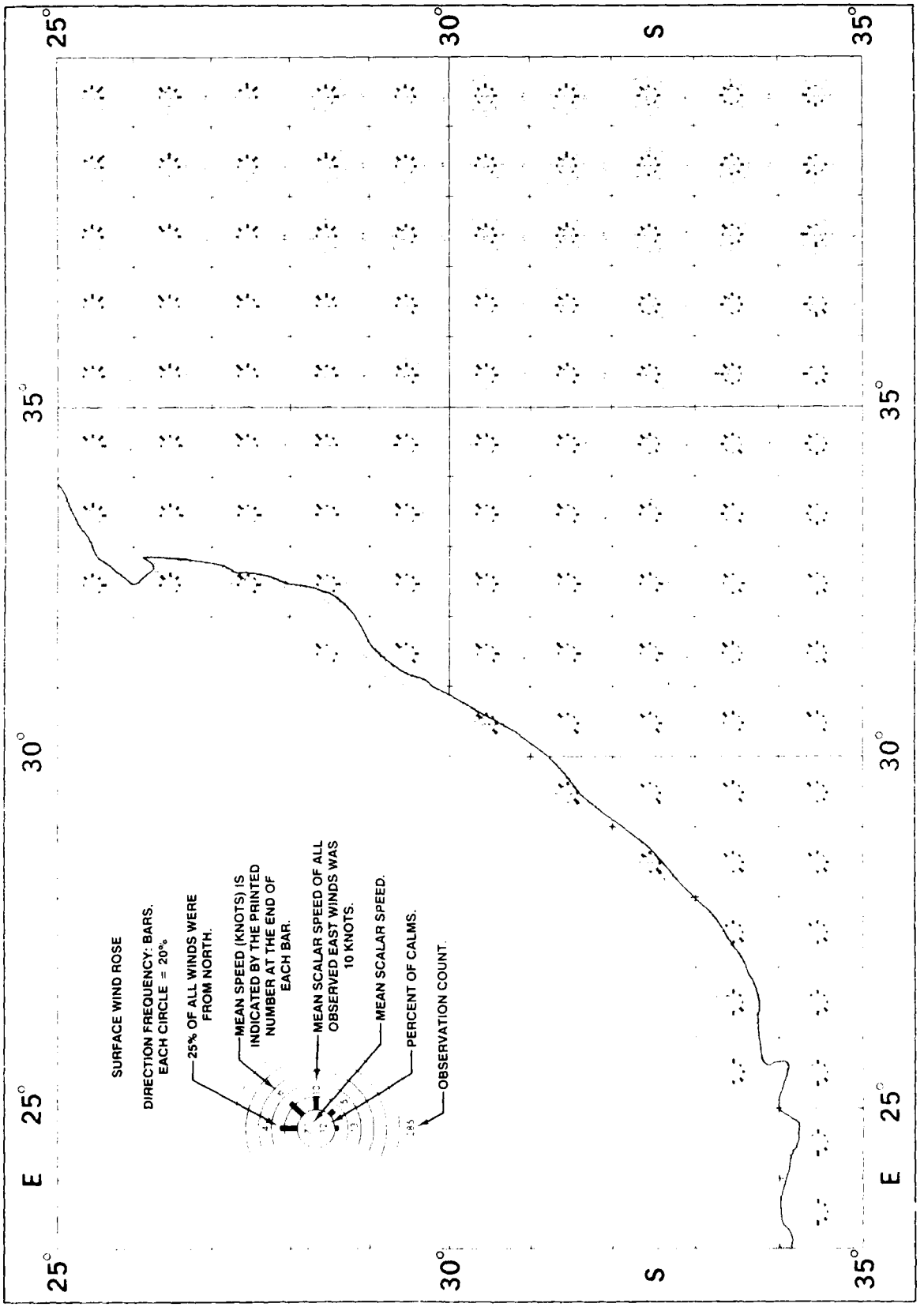
December

Surface Wind Roses



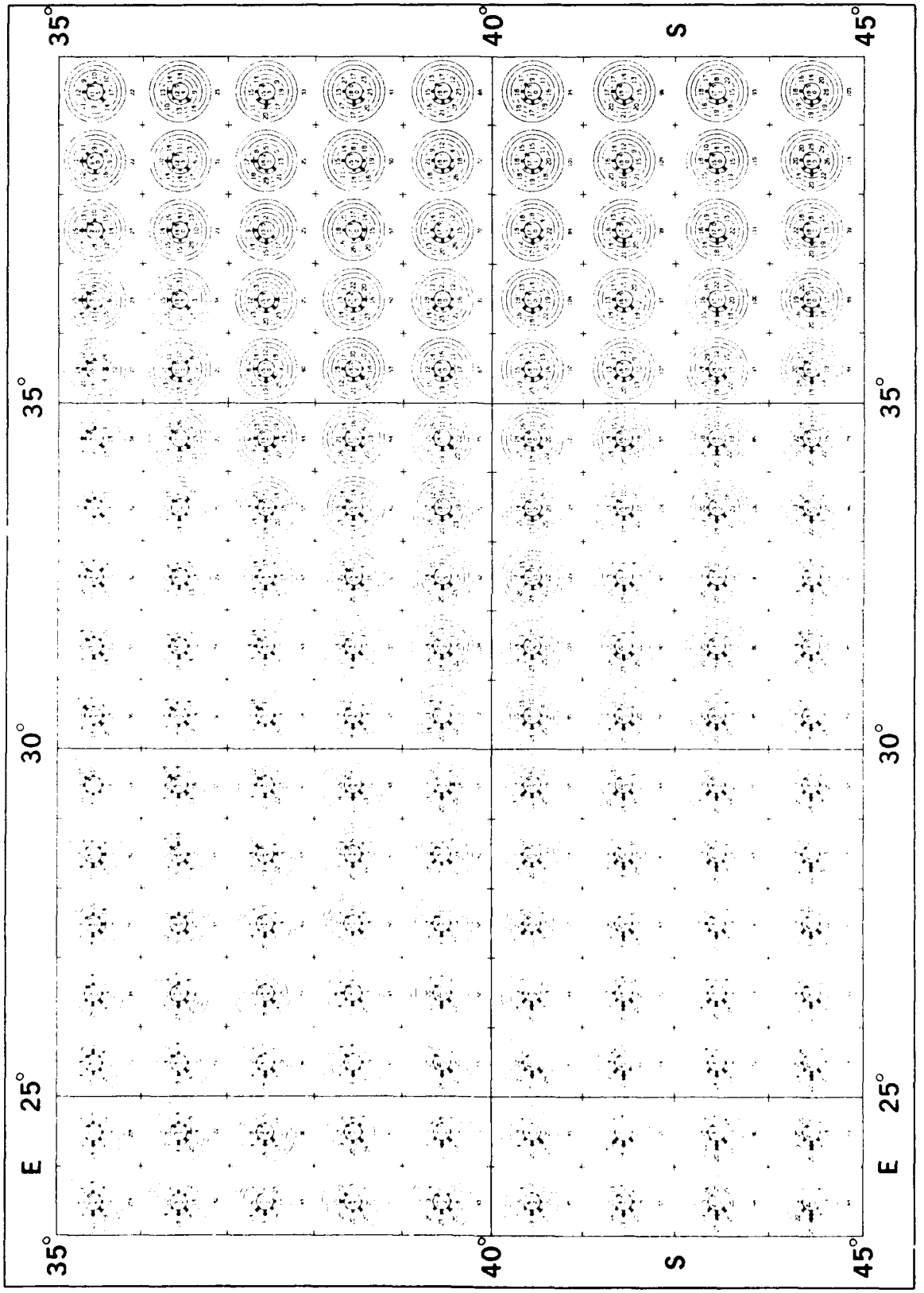
December

Surface Wind Roses

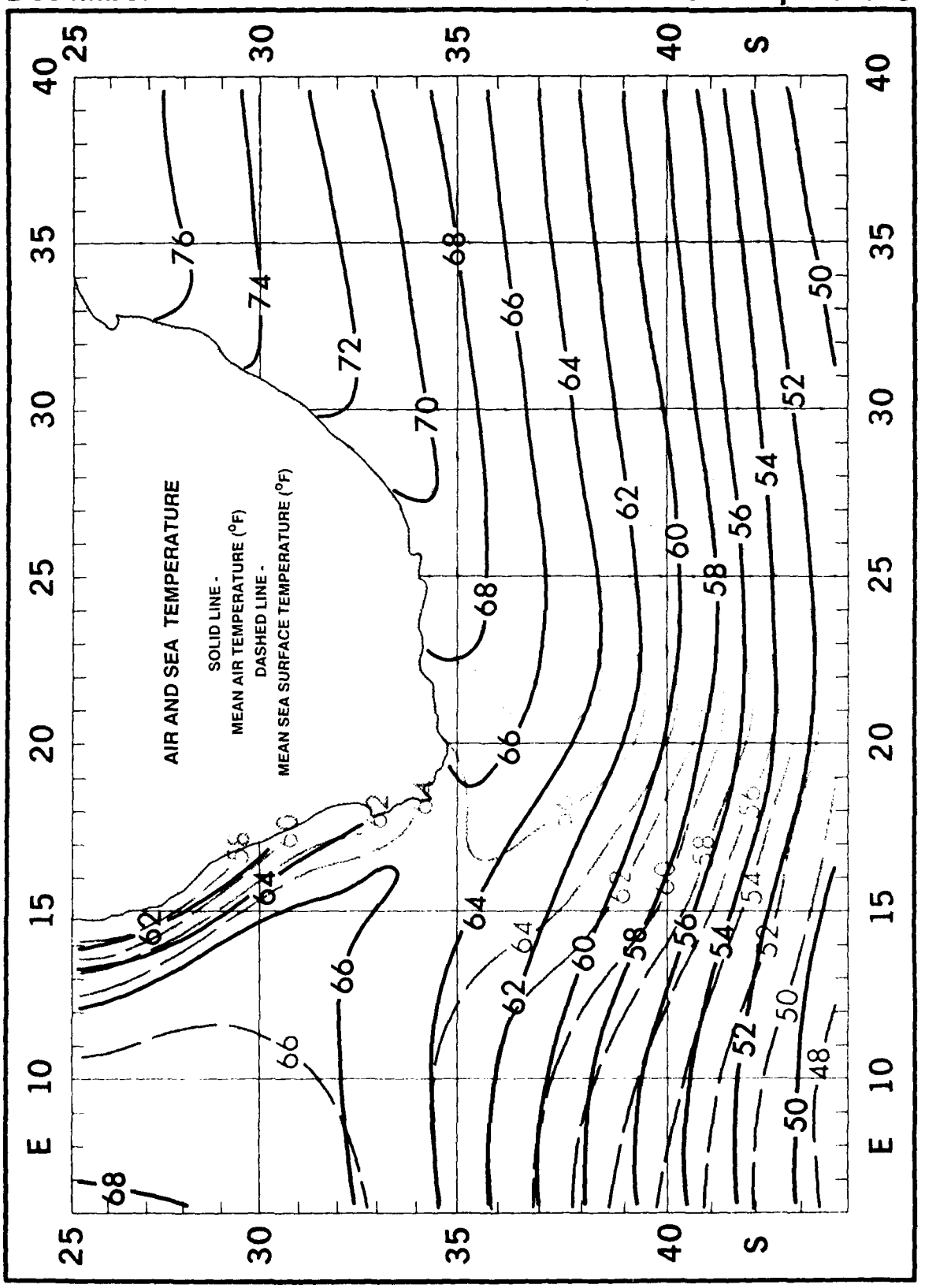


December

Surface Wind Roses

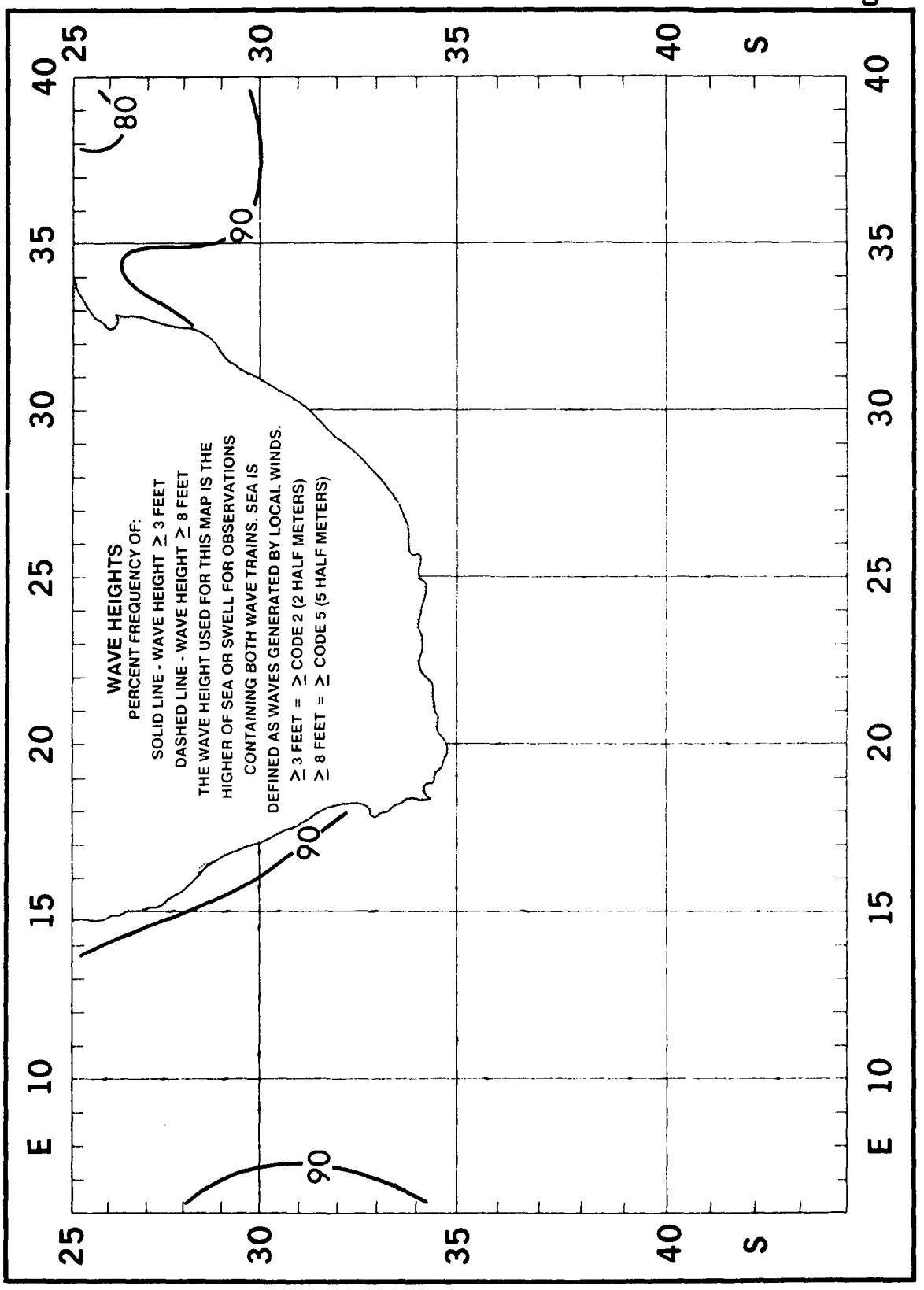


December **Air and Sea Temperature**

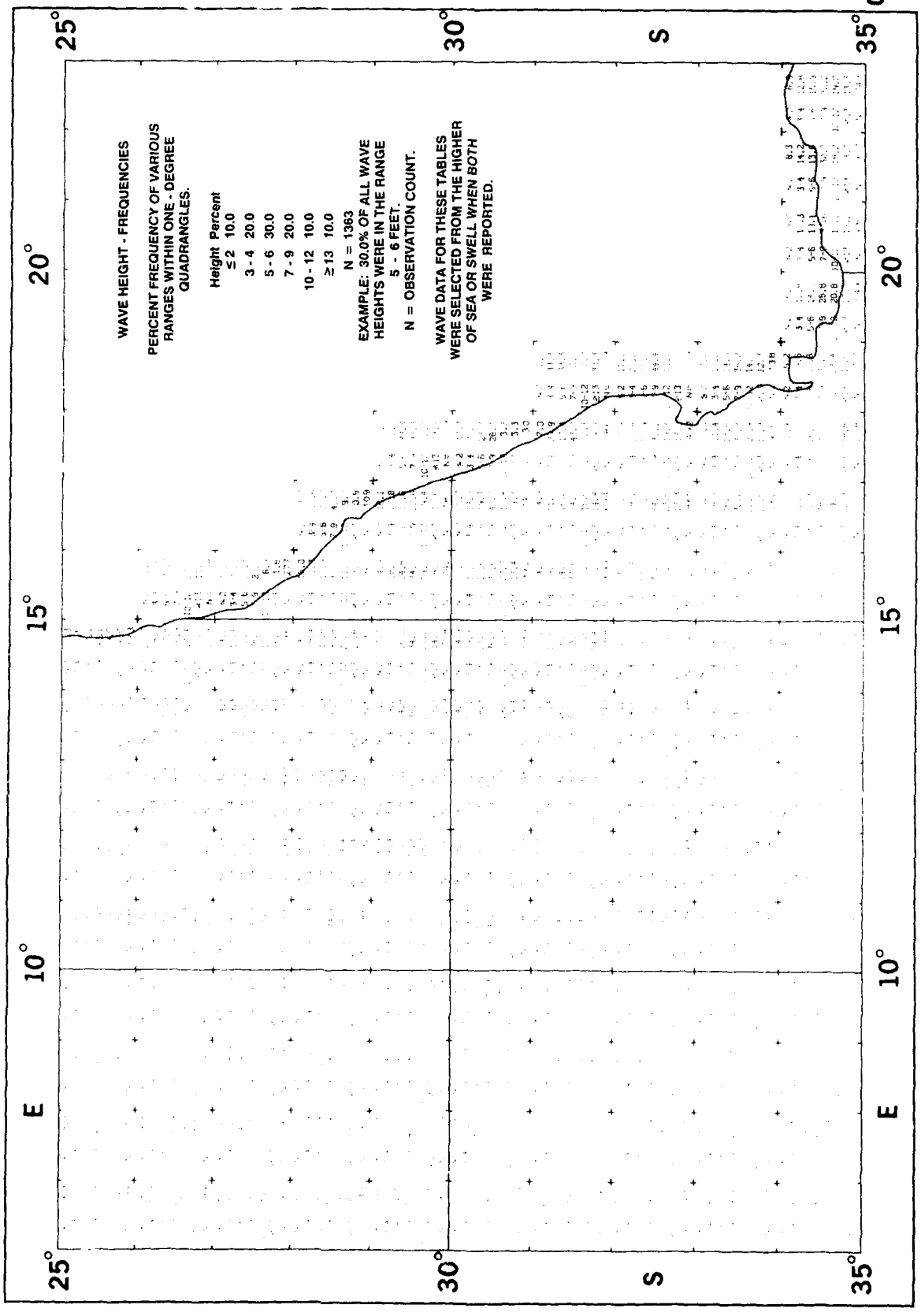


December

Wave Height

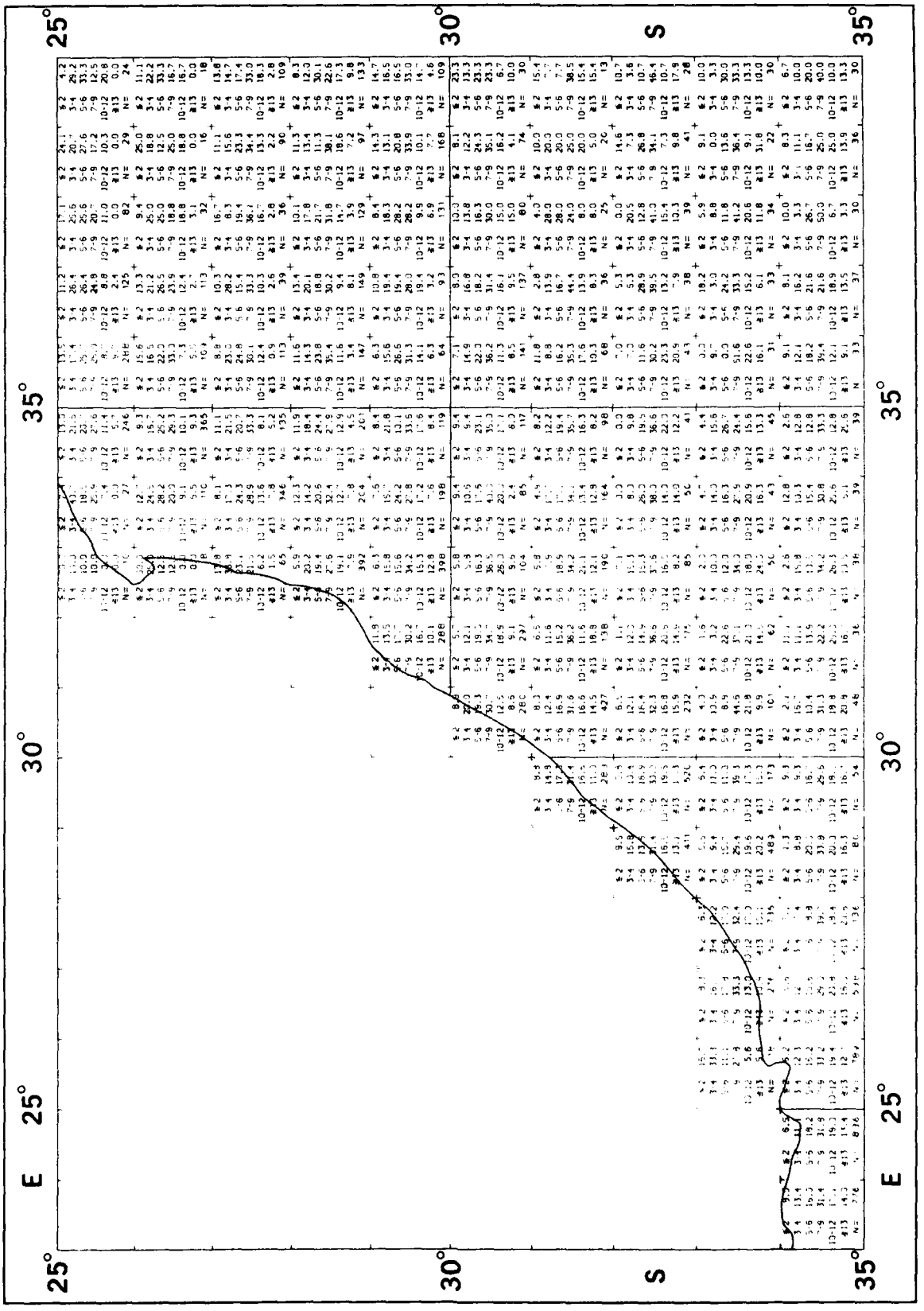


December **Wave Height**



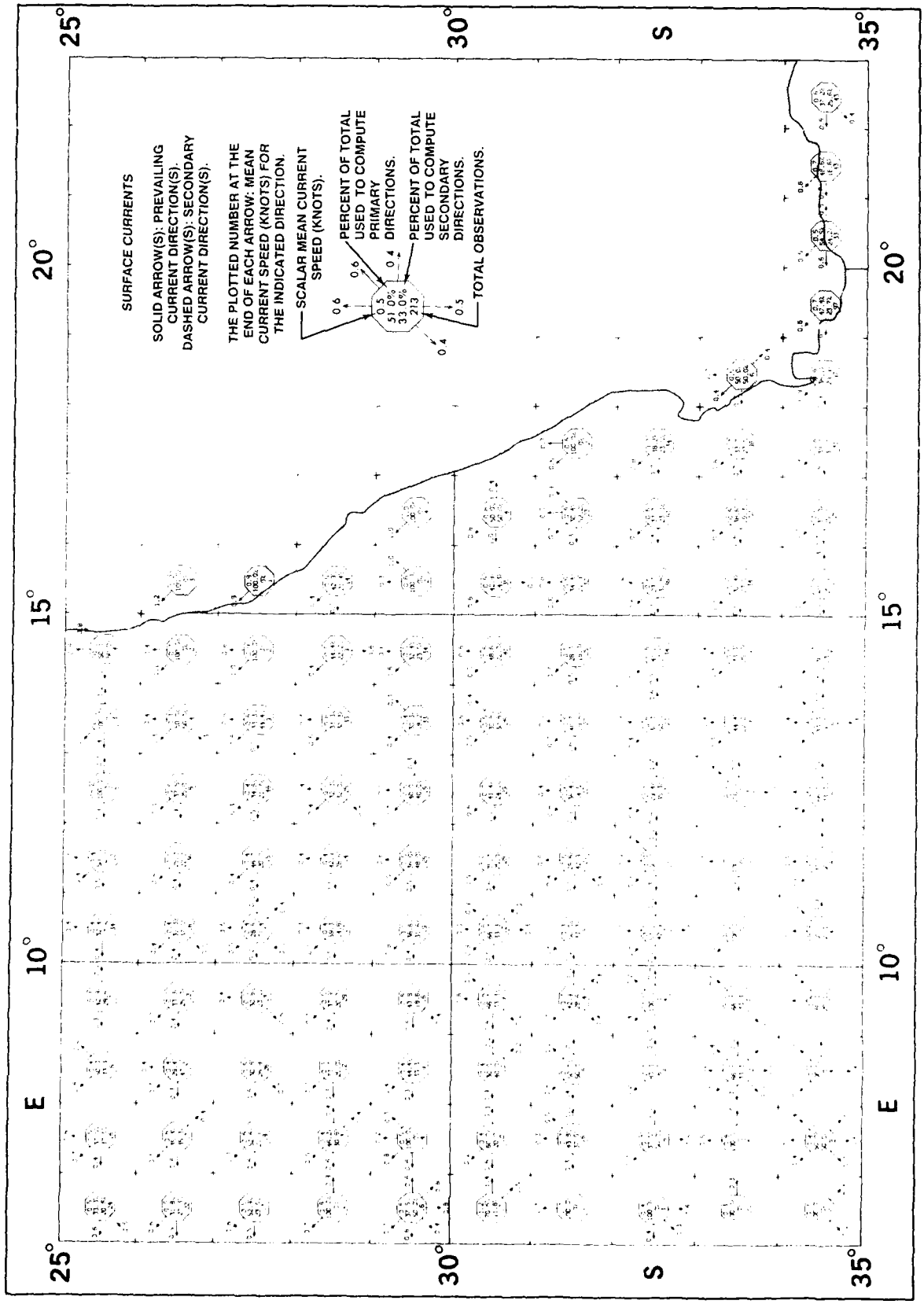
December

Wave Height



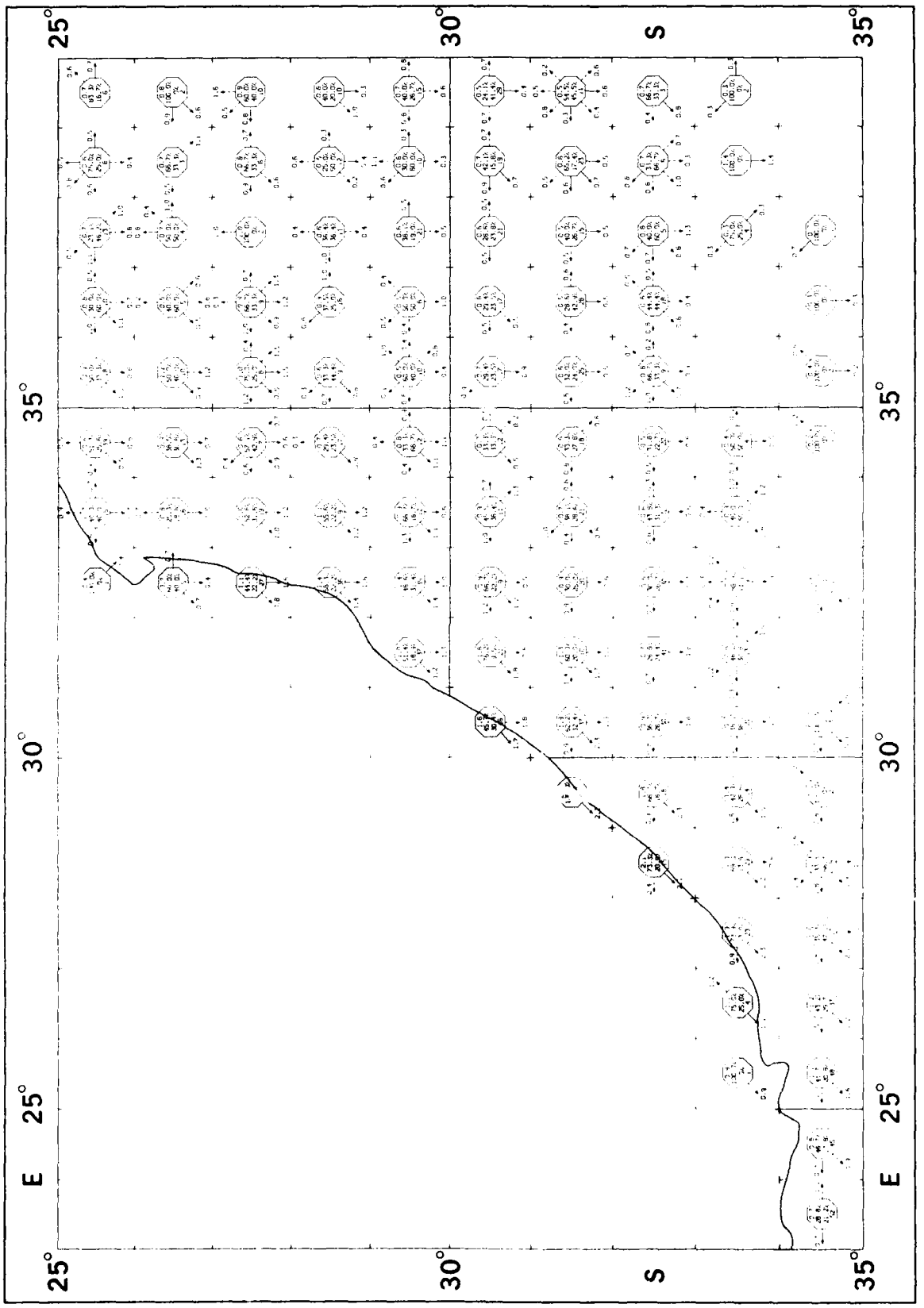
December

Surface Currents



December

Surface Currents



Station Climatic Summaries

The following Station Climatic Summaries are based on data from many different sources, with most stations having variable periods-of-record. Considerable effort went into making these data as compatible as possible for each station. However, for some stations a more recent shorter period-of-record was selected over a longer period because the shorter record is more representative of the current climate. Also, in some instances, the station periods-of-record were mixed because only one period-of-record source could be found for a given element. For example, the mean daily maximum and minimum temperatures for a given station may have been based on a period other than that for the mean temperature because of incomplete data records. This practice sometimes gives inconsistencies in the summarized data set.

Station relocations and varying periods-of-record also introduce inconsistencies. For example, inconsistencies often appear when comparing absolute minimum temperatures from one period-of-record with the total number of days below freezing from another period.

Ideally, these Station Climatic Summaries should be generated from a relatively consistent long-term digital station data base. Unfortunately that is not possible for most foreign-reporting stations at this time.

Summaries for the following stations appear in alphabetical order:

Alexander Bay, South Africa

Cape Agulhas, South Africa

Cape Hermes, South Africa

Cape Town, South Africa

Durban, South Africa

East London, South Africa

George, South Africa

Luderitz Bay, Namibia

Maputo, Mozambique

Port Elizabeth, South Africa

Port Nolloth, South Africa

PARED BY: NOCD ASHEVILLE   STATION NAME: ALEXANDER BAY, SOUTH AFRICA   ELEVATION: 69 FEET   WMO #: 68406
LOCATION: 28 34S 16 32E

	TEMPERATURE (F) MEANS			EXTREME		PRECIPITATION (INCHES)				SNOWFALL			RELATIVE HUMIDITY		VAPOR PRESSURE (INCHES OF MERCURY)	DEW POINT (F)	PRESSURE ALTITUDE (FEET (99.95%))	SURFACE WIND (KTS)			MEAN CLOUD AMOUNT (EIGHTHS)	MEAN NUMBER OF DAYS WITH PRECIPITATION	SNOWFALL	THUNDERSTORMS	VISIBILITY REDUCED BY FOG	TEMPERATURE			
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	MEAN	MAXIMUM	MINIMUM	24-HR MAXIMUM	MEAN	MAXIMUM	24-HR MAXIMUM	[illegible] LST	[illegible] LST				DIRECTION	SPEED	MAX GUST		[illegible]				≥ 90	≥ 80	≤ 32	≤ 49
JAN	[illegible]	59	67	107	48	#	[illegible]	0.0	[illegible]				86	61	33	58		[illegible]	12	44	4	1	0	#	1	#	5	0	0
FEB	75	59	67	108	48	0.1	1.1	0.0	[illegible]				81	61	44	58		[illegible]	11	42	4	1	0	1	1	#	3	0	#
MAR	76	57	67	108	41	0.1	1.4	0.0	0.3				89	63	46	58		[illegible]	10	36	4	1	0	1	8	1	4	0	1
APR	74	54	64	106	42	0.1	[illegible]	0.0	0.4				87	66	[illegible]	55		[illegible]	8	36	4	1	0	1	9	3	6	0	6
MAY	72	51	62	103	39	[illegible]	[illegible]	0.0	1.5				93	57	38	44		[illegible]	7	22	4	2	0	#	11	2	6	0	15
JUN	71	49	60	92	35	[illegible]	1.1	[illegible]	0.8				76	50	34	44		[illegible]	7	41	[illegible]	2	0	#	7	#	6	0	16
JUL	69	48	59	98	37	[illegible]	[illegible]	0.0	0.5				79	51	41	41		[illegible]	7	40	[illegible]	1	0	#	8	#	6	0	21
AUG	68	49	58	97	35	0.2	1.6	0.0	0.8				81	57	44	44		[illegible]	8	41	4	1	0	#	2	1	4	0	21
SEP	70	53	60	107	39	[illegible]	[illegible]	0.0	0.8				87	57	44	49		[illegible]	10	[illegible]	4	1	0	1	5	1	4	0	13
OCT	71	52	61	106	41	0.2	1.2	0.0	[illegible]				81	61	40	53		[illegible]	11	41	4	1	0	1	1	1	[illegible]	0	[illegible]
NOV	74	55	64	108	41	0.1	0.2	0.0	[illegible]				80	60	48	54		[illegible]	12	44	4	1	0	1	2	1	2	0	2
DEC	74	58	66	102	48	[illegible]	[illegible]	[illegible]	[illegible]				83	62	41	57		[illegible]	12	41	4	1	0	#	2	1	2	0	#
ANN	72	53	66	108	35	1.1	[illegible]	[illegible]	1.5				84	59	41	53		[illegible]	10	44	4	18	0	6	68	11	48	0	104
EYR	38	30	39	20+	20+	34	[illegible]	34	[illegible]				23	20	24	24		12	12	12	14	12	12	29	27	12	12	12	12

LESS THAN 0.5 [illegible] OR 0.05 INCH, OR [illegible] AS APPLICABLE
THE VALUE LISTED UNDER PRESSURE ALTITUDE INDICATES THAT VALUE IS EXCEEDED ONLY 0.05 % OF THE TIME WHEN
LABELED 99.95% OTHERWISE IT IS THE MEAN
EYR IS EQUIVALENT YEARS OF RECORD [illegible] THE ACTUAL NUMBER OF YEARS UTILIZED IN THE CALCULATIONS [illegible]

FLYING WEATHER   PERCENT OF HOURS

HOUR (LST)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YRS
CEILING LESS THAN 5000 FEET AND/OR VISIBILITY LESS THAN 6 MI														
07	56	61	61	51	46		44	49	51	51	45	52		12
13	10	6	4	10	11		14	20	13	14	9	9		12
19	28	20	[illegible]	24	21		21	20	25	18	15	12		12
ALL HRS	32	32	[illegible]	29	26		27	[illegible]	[illegible]	[illegible]	28	[illegible]	29	12
CEILING LESS THAN [illegible] FEET AND/OR VISIBILITY LESS THAN 2 1/2 MI														
07	51	54	54	44	40		39	[illegible]	44	[illegible]	40	45		12
13	9	5	[illegible]	8	7		10	11	9	8	5	[illegible]		12
19	26	28	21	19	16		17	13	20	22	22	30		12
HRS	29	29	26	24	22	[illegible]	22	22	21	24	22	29	25	12
CEILING LESS THAN 1000 FEET AND/OR VISIBILITY LESS THAN 2 1/2 MI														
07	22	41	38	30	30		25	24	27	14	16	19		12
13	2	1	1	1	2		2	2	2	2	1	1		12
19	10	16	13	12	14		11	6	9	5	[illegible]	11		12
HRS	12	17	17	14	15		12	[illegible]	14	7	[illegible]	11	12	12
CEILING LESS THAN 650 FEET AND/OR VISIBILITY LESS THAN 1 1/4 MI														
07	12	22	32	24	27	[illegible]	22	13	20	17	7	12		12
13	1	1	#	#	2		1	1	1	1	1	1		12
19	4	9	8	10	9		8	4	5	1	2	5		12
HRS	6	11	14	12	13	[illegible]	10	8	9	3	[illegible]	6	9	12
CEILING LESS THAN 300 FEET AND/OR VISIBILITY LESS THAN 5/8 MI														
07	5	10	24	13	21	13	16	15	16	4	3	4		12
13	#	1	#	#	1	#	1	1	#	1	1	#		12
19	2	4	4	5	6	4	4	3	1	0	#	2		12
ALL HRS	3	5	10	8	9	5	7	7	6	2	1	2	6	12

ALEXANDER BAY, SOUTH AFRICA

PREPARED BY: NOCD ASHEVILLE   STATION NAME: CAPE AGULHAS, SOUTH AFRICA   ELEVATION: 20 FEET   WMO #: 68920
LOCATION: 34 50S 20 01E

	TEMPERATURE (F) MEANS			EXTREME		PRECIPITATION (INCHES)				RELATIVE HUMIDITY		PRESSURE ALTITUDE	DEW POINT (F)	SURFACE WIND (KTS)			MEAN CLOUD AMOUNT (TENTHS)		MEAN NUMBER OF DAYS WITH PRECIPITATION	SNOWFALL	THUNDERSTORMS	VISIBILITY < 1/2 MI IN FOG	TEMPERATURE	
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	MEAN	MAXIMUM	MINIMUM	24 HOUR MAXIMUM	[illegible] LST	[illegible] LST			DIRECTION	SPEED	MAX GUST	[illegible] LST	[illegible] LST	[illegible]				87	40
JAN	75	64	69	94	45	1.0	5.[illegible]	0	4.6	81	72		64	E	12		6	4	7	0	1	1	0	0
FEB	75	64	69	97	48	0.8	[illegible]	0	2.3	84	73		67	E	12		6	4	6	0	#	1	#	#
MAR	73	62	67	96	49	1.4	5.0	0	2.8	87	76		61	E	13		6	4	8	0	1	2	#	0
APR	69	58	63	96	40	1.9	6.[illegible]	0	1.6	88	78		58	E	11		6	5	11	0	1	2	#	0
MAY	67	55	61	96	48	2.2	5.4	0	1.9	86	77		54	W	13		5	5	12	0	#	2	#	#
JUN	63	52	58	86	[illegible]	2.5	[illegible]	0	2.4	83	71		51	W	11		5	5	13	0	#	1	0	#
JUL	64	51	57	85	[illegible]	[illegible]	[illegible]	[illegible]	1.7	86	[illegible]		49	W	[illegible]		[illegible]	5	12	0	#	2	0	#
AUG	62	51	57	98	34	2.4	[illegible]	[illegible]	1.8	85	75		51	W	12		5	4	13	0	#	1	#	#
SEP	64	51	58	101	34	1.5	[illegible]	[illegible]	2.5	84	76		51	W	12		6	5	10	0	#	1	#	#
OCT	66	55	61	80	38	1.8	[illegible]	[illegible]	4.8	81	74		[illegible]	W	13		5	5	11	0	#	1	0	#
NOV	69	59	64	91	41	1.1	4.5	0	7.8	80	73		57	W	13		6	5	8	0	#	1	#	0
DEC	73	61	67	87	41	1.0	4.5	0	3.7	76	72		59	W	14		6	4	6	0	#	1	#	0
ANN	68	57	63	101	31	19.6	28.[illegible]	8.0	4.8	84	76		55	W	12		6	5	116	0	4	15	#	#
EYR	30	30	30	104	104	30	106	106	[illegible]	29	28		16	5	5		68	68	20	10	51	31	53	34

\# LESS THAN 0.5 DAYS, 0.5 OR 0.05 INCH, OR 0.5 PERCENT AS APPLICABLE
THE VALUE LISTED UNDER PRESSURE ALTITUDE INDICATES THAT VALUE IS EXCEEDED ONLY 0.05 % OF THE TIME WHEN
LABELED 99.95% OTHERWISE IT IS THE MEAN
EYR IS EQUIVALENT YEARS OF RECORD (I.E. THE ACTUAL NUMBER OF YEARS UTILIZED IN THE CACULATIONS.)

CAPE AGULHAS, SOUTH AFRICA

PREPARED BY: NOCD ASHEVILLE   STATION NAME: CAPE HERMES, SOUTH AFRICA   ELEVATION: 154 FEET   WMO #: 68674
LOCATION: 31 38S 29 33E

	TEMPERATURE (F) MEANS			EXTREME		PRECIPITATION (INCHES)				RELATIVE HUMIDITY		PRESSURE ALTITUDE	DEW POINT (F)	SURFACE WIND (KTS) PREVAILING			MEAN CLOUD AMOUNT (TENTHS)		MEAN NUMBER OF DAYS WITH PRECIPITATION	SNOWFALL	THUNDERSTORMS	VISIBILITY < 1/2 MI IN FOG	TEMPERATURE	
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	MEAN	MAXIMUM	MINIMUM	24 HOUR MAXIMUM	[illegible] LST	[illegible] LST			DIRECTION	SPEED	MAX GUST	[illegible] LST	[illegible] LST	[illegible]				87	40
JAN	77	67	72	89	54	4.6	11.[illegible]	1.4	2.8	82	82		66	NE	18		6	6	13	0	4	0	#	0
FEB	78	68	73	91	52	5.1	18.[illegible]	0.6	6.1	82	82		67	NE	17		6	6	11	0	3	#	#	0
MAR	77	67	72	95	47	5.8	20.0	1.0	6.5	82	82		66	NE	17		6	5	11	0	3	#	#	0
APR	75	64	69	94	52	3.4	11.6	0.1	5.4	77	79		62	SW	11		5	5	9	0	2	0	1	0
MAY	74	60	67	94	48	2.0	22.8	0.1	3.6	68	73		56	NW	8		4	4	6	0	1	0	1	0
JUN	72	57	64	91	42	1.5	12.1	0.0	3.7	62	67		52	NW	8		3	4	4	0	1	0	#	0
JUL	71	56	63	91	44	1.6	20.9	0.0	4.4	61	69		49	NW	8		3	4	4	0	#	0	#	0
AUG	70	57	64	98	41	1.9	9.8	0.0	4.0	68	75		55	SW	11		4	4	6	0	1	#	1	0
SEP	72	59	65	103	[illegible]	1.4	19.8	0.4	5.4	75	79		57	SW	12		6	6	9	0	1	#	1	0
OCT	71	61	66	106	[illegible]	4.7	16.7	1.5	5.7	79	81		60	SW	11		6	6	14	0	2	#	#	0
NOV	73	63	68	100	[illegible]	4.7	11.3	0.4	7.1	80	83		62	NE	18		7	7	15	0	4	#	#	0
DEC	76	66	71	92	46	4.7	13.2	0.6	3.2	80	81		64	NE	17		6	6	15	0	3	#	#	0
ANN	74	62	68	106	42	44.1	79.5	23.7	7.1	75	78		60	NE	17		5	5	123	0	22	1	5	0
EYR	51	50	49	62		94	94	94	52	30	30		19	15	20		20	18	20	10	32	24	20	30

\# LESS THAN 0.5 DAYS, 0.5 OR 0.05 INCH, OR 0.5 PERCENT AS APPLICABLE
THE VALUE LISTED UNDER PRESSURE ALTITUDE INDICATES THAT VALUE IS EXCEEDED ONLY 0.05 % OF THE TIME WHEN
LABELED 99.95% OTHERWISE IT IS THE MEAN
EYR IS EQUIVALENT YEARS OF RECORD (I.E. THE ACTUAL NUMBER OF YEARS UTILIZED IN THE CACULATIONS.)

CAPE HERMES, SOUTH AFRICA

PREPARED BY: NOCD ASHEVILLE STATION NAME: CAPE TOWN, SOUTH AFRICA ELEVATION: 151 FEET WMO #: 68816
LOCATION: 33 59S 18 36E

	TEMPERATURE (F) MEANS MAXIMUM	MEANS MINIMUM	MEANS AVERAGE	EXTREME MAXIMUM	EXTREME MINIMUM	PRECIPITATION (INCHES) MEAN	MAXIMUM	MINIMUM	24-HR MAXIMUM	SNOWFALL MEAN	SNOWFALL MAXIMUM	SNOWFALL 24-HR MAXIMUM	RELATIVE HUMIDITY 0700 LST	RELATIVE HUMIDITY 1300 LST	VAPOR PRESSURE (INCHES OF MERCURY)	DEW POINT (F)	PRESSURE ALTITUDE (FEET 1013 MB)	SURFACE WIND (KTS) DIRECTION	SPEED	MAX GUST	MEAN CLOUD AMOUNT (TENTHS)	MEAN NUMBER OF DAYS WITH PRECIPITATION .01 OR MORE	PRECIPITATION .04 OR MORE	SNOWFALL	THUNDERSTORMS	VISIBILITY 6 MI OR LESS	TEMPERATURE 90 OR ABOVE	TEMPERATURE 60 OR ABOVE	TEMPERATURE 32 OR BELOW	TEMPERATURE 0 OR BELOW
JAN	76	60	68	101	46	0	2	0	1	0			73	52					11			7		0		2	1			
FEB	76	59	68	99	44	0	2	0	1	0			78	53					10			6		0		2	1			
MAR	76	57	66	105	40	0	1	0	1	0			85	52					9			5		0		4	1			
APR	73	52	63	102	36	1	4	0	2	1			89	55					7			8		0		5	1			
MAY	67	48	57	92	34	2	6	0	2	2			91	63					7			13		0		5	0			
JUN	64	45	54	83	30	3	8	0	3	2			90	63					7			12		0		4	0			
JUL	63	44	53	84	30	2	6	0	2	2			91	64					7			12		0		3	0			
AUG	64	45	54	88	33	1	4	0	2	2			90	62					8			11		0		3	0			
SEP	67	47	57	97	37	1	3	0	1	1			88	58					8			10		0		3	0			
OCT	70	50	60	96	34	1	4	0	2	1			80	56					9			8		0		3	0			
NOV	75	55	64	96	39	1	2	0	1	0			77	53					11			5		0		3	1			
DEC	77	58	67	99	46	0	2	0	0	0			78	53					12			5		0		3	1			
ANN	71	51	61	105	30	20	8	0	3	12			83	57					9			103		0		33	64			
CYR	19	19	20	19	19	20			20	20			19	19					12			19		12		12	12			

LESS THAN 0.5 DAYS, 0.5 OR 0.05 ENCH, OR 0.5 PERCENT AS APPLICABLE

THE VALUE LISTED UNDER PRESSURE ALTITUDE INDICATES THAT VALUE IS EXCEEDED ONLY 0.05 % OF THE TIME WHEN
LABELED OTHERWISE IT IS THE MEAN

CYR IS EQUIVALENT YEARS OF RECORD (I.E. THE ACTUAL NUMBER OF YEARS UTILIZED IN THE CALCULATIONS)

FLYING WEATHER, PERCENT OF HOURS

HOUR (LST)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YRS
CEILING LESS THAN 5000 FEET AND/OR VISIBILITY LESS THAN 6 MI														
07	22	28	21	34	45	49	43	47	44	36	28	23		12
13	11	16	11	26	31	32	35	35	28	22	13	14		12
19	14	14	18	20	31	39	34	30	29	24	14	13		12
ALL HRS	16	19	20	26	35	40	37	38	30	25	19	16	27	12
CEILING LESS THAN 3300 FEET AND/OR VISIBILITY LESS THAN 2 1/2														
07	19	22	25	30	39	42	36	35	33	30	25	20		12
13	7	11	9	16	25	27	31	30	23	13	10	10		12
19	11	10	15	16	24	30	27	24	17	15	12	12		12
ALL HRS	12	14	16	20	32	43	31	30	24	19	15	13	22	12
CEILING LESS THAN 1000 FEET AND/OR VISIBILITY LESS THAN 2 MI														
07	5	6	9	12	15	17	14	11	7	7	6	2		12
13	2	3	3	3	4	5	3	4	4	2	3	1		12
19	3	4	6	6	10	9	7	4	4	3	2	4		12
ALL HRS	3	4	5	7	10	10	8	6	5	4	3	2	5	12
CEILING LESS THAN 650 FEET AND/OR VISIBILITY LESS THAN 1 1/4														
07	1	5	7	10	9	11	11	6	4	3	3	1		12
13	0	0	0	2	2	2	2	2	1	1	1	0		12
19	2	3	3	3	7	6	5	2	2	2	3	2		12
ALL HRS	1	3	4	5	6	7	6	3	2	2	2	1	3	12
CEILING LESS THAN 300 FEET AND/OR VISIBILITY LESS THAN 1/2 MI														
07	1	3	5	6	7	10	8	4	3	1	2	0		12
13	0	0	0	0	0	0	0	0	0	0	0	0		12
19	0	1	2	2	4	3	4	1	1	1	1	0		12
ALL HRS	0	1	2	3	4	4	4	1	1	1	1	0	2	12

CAPE TOWN, SOUTH AFRICA

PREPARED BY: NOCD ASHEVILLE STATION NAME: DURBAN, SOUTH AFRICA ELEVATION: 36 FEET WMO #: 68588
LOCATION: 29 58S 30 57E

	TEMPERATURE (F) MEANS			EXTREME		PRECIPITATION (INCHES)				SNOWFALL			RELATIVE HUMIDITY		SURFACE WINDS (KTS)						MEAN NUMBER OF DAYS WITH PRECIPITATION		SNOWFALL			TEMPERATURE			
JAN	82	69	76	98	56	[illegible]	15.0	[illegible]	[illegible]				[illegible]	[illegible]		[illegible]		[illegible]	[illegible]	[illegible]	15	4	0	4	*	1	22	0	0
FEB	82	70	76	104	58	[illegible]	[illegible]	[illegible]	[illegible]				[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	12	4	0	1	*	*	22	0	0
MAR	82	68	75	94	57	[illegible]	15.0	[illegible]	[illegible]				[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	14	4	0	4	*	1	24	0	0
APR	79	63	71	95	48	[illegible]	11	[illegible]	[illegible]				[illegible]	[illegible]	[illegible]	4		[illegible]	[illegible]	4	11	[illegible]	0	[illegible]	*	*	13	0	*
MAY	76	56	66	88	41	[illegible]	[illegible]	[illegible]	[illegible]				[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	6	1	0	2	*	0	6	[illegible]	[illegible]
JUN	73	50	62	88	38	[illegible]	[illegible]	[illegible]	[illegible]				[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	4	1	0	1	0	0	2	0	12
JUL	73	50	62	92	37	[illegible]	[illegible]	[illegible]	[illegible]				[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	6	1	0	1	*	0	2	0	14
AUG	74	54	64	90	[illegible]	[illegible]	4	[illegible]	[illegible]				[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	6	1	0	[illegible]	1	*	4	0	10
SEP	74	59	67	98	41	[illegible]	[illegible]	[illegible]	[illegible]				[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	10	[illegible]	0	2	*	*	4	0	1
OCT	76	62	69	104	41	[illegible]	10	[illegible]	[illegible]				[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	15	[illegible]	0	4	*	*	6	0	*
NOV	78	65	71	94	50	4	[illegible]	1	[illegible]				[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	12	4	0	4	*	*	11	0	0
DEC	80	68	74	96	54	4	[illegible]	[illegible]	[illegible]				[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	16	[illegible]	0	5	*	1	20	0	0
ANN	77	61	69	104	37	38	46	28	[illegible]				[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	20	0	[illegible]	[illegible]	4	135	0	57
EYR	15	15	40	10	14	40	40	40	15				[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	12	[illegible]	12	12	12	12	12

* LESS THAN 0.5 DAYS, 0.5 OR 0.05 INCH, OR 0.5 PERCENT AS APPLICABLE
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EARLIED ... OTHERWISE IT IS THE MEAN.
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FLYING WEATHER, - PERCENT OF HOURS

HOUR (LST)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YRS
CEILING LESS THAN 5000 FEET AND/OR VISIBILITY LESS THAN 6 MI														
08	46	41	46	51	48	56	59	57	57	43	46	40		12
14	35	26	39	23	34	17	14	25	30	46	38	32		12
20	60	50	54	41	47	40	42	45	50	50	62	58		12
ALL HRS	47	40	40	40	44	35	40	44	46	48	49	43	42	12
CEILING LESS THAN 3000 FEET AND/OR VISIBILITY LESS THAN 2 1/2 MI														
08	33	22	27	19	19	15	18	20	27	41	43	34		12
14	30	22	16	12	9	7	7	12	24	30	34	28		12
20	52	40	44	34	24	15	22	25	43	50	54	54		12
ALL HRS	38	28	27	21	14	12	16	20	28	36	41	35	26	12
CEILING LESS THAN 1000 FEET AND/OR VISIBILITY LESS THAN 2 1/2 MI														
08	7	4	4	4	1	2	9	10	8	6	6	8		12
14	5	4	3	3	1	1	1	2	4	3	7	6		12
20	9	4	5	2	4	2	3	2	5	10	10	9		12
ALL HRS	7	4	4	1	3	3	4	5	6	7	8	7	5	12
CEILING LESS THAN 650 FEET AND/OR VISIBILITY LESS THAN 1 1/4 MI														
08	2	1	1	*	1	*	2	2	1	2	2	2		12
14	2	*	0	1	*	0	0	0	1	1	1	1		12
20	1	1	1	1	1	1	*	0	1	2	1	*		12
ALL HRS	1	1	1	1	1	*	1	1	1	1	1	1	1	12
CEILING LESS THAN 300 FEET AND/OR VISIBILITY LESS THAN 5/8 MI														
08	*	0	0	0	0	0	*	0	1	0	1	0		12
14	0	0	0	0	0	0	0	0	0	0	*	0		12
20	*	0	0	0	*	1	0	0	0	0	0	0		12
ALL HRS	*	0	0	0	*	*	*	0	*	0	*	0	*	12

DURBAN, SOUTH AFRICA

PREPARED BY: NAVY ASHEVILLE STATION NAME: EAST LONDON, SOUTH AFRICA ELEVATION: 427 FEET WMO #: 68858
LOCATION: 33 02'S 27 56'E

	TEMPERATURE (F) MEANS			TEMPERATURE (F) EXTREMES		PRECIPITATION (INCHES)				SNOWFALL			RELATIVE HUMIDITY		SURFACE WIND (KTS) OVER LAND					MEAN NUMBER OF DAYS WITH PRECIPITATION						TEMPERATURE			
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	MEAN	MAXIMUM	MINIMUM	24 HR MAXIMUM	MEAN	MAXIMUM	24 HR MAXIMUM	0900 LST	1500 LST	DIRECTION	SPEED	MAX GUST	DIRECTION	SPEED	MAX GUST	MEAN SPEED (KNOTS)	.10 OR MORE	.50 OR MORE	SNOWFALL 1 OR MORE	THUNDERSTORMS	VISIBILITY 6 MI OR LESS FOG	>= 90	>= 80	<= 32	<= 0
JAN	78	64	71	96	48	3	9	0	4				74	72								14	8	2	0	1	1	10	0	0
FEB	78	65	71	104	52	3	8	0	5				77	73								12	6	1	0	1	1	12	0	0
MAR	77	64	70	101	51	4	11	0	5				81	76								11	6	1	0	1	1	12	0	0
APR	74	57	67	94	45	3	12	0	5				87	87								10	5	1	0	1	1	7	0	1
MAY	72	54	64	91	36	2	7	0	4				87	84								8	4	0	0	1	1	4	0	4
JUN	70	51	61	91	32	1	6	0	3				88	86								5	3	0	0	1	1	4	0	12
JUL	70	50	60	91	35	2	8	0	6				86	84								5	3	0	0	1	1	4	0	11
AUG	70	52	61	100	36	1	3	0	2				84	84								5	3	0	0	1	1	4	0	11
SEP	70	54	62	106	41	1	3	0	2				79	76								6	3	0	0	1	1	4	0	4
OCT	74	57	66	106	46	3	10	0	10				77	74								14	7	0	0	1	1	8	0	2
NOV	76	61	68	105	47	4	8	0	5				77	74								11	7	0	0	1	1	11	0	0
DEC	78	62	69	101	47	2	8	0	5				77	74								11	6	0	0	1	1	12	0	0
ANN	74	58	66	106	32	26	12	0	10	0	0	0	81	78								124	68	5	0	12	12	96	0	45
EYR	35	30	30	35	30	18	12	14	14				30	30	12	12	12	12	12	12	12	20	12	12	38	19	12	12	12	12

LESS THAN 0.5 DAYS, 0.5 OR 0.05 INCH, OR 0.5 PERCENT AS APPLICABLE
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EYR IS EQUIVALENT YEARS OF RECORD (I.E. THE ACTUAL NUMBER OF YEARS UTILIZED IN THE CALCULATIONS)

FLYING WEATHER, - PERCENT OF HOURS

HOUR (LST)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YRS
CEILING LESS THAN 5000 FEET AND/OR VISIBILITY LESS THAN 5 MI														
08	45	41	41	30	20	17	24	22	33	37	42	40		12
14	40	35	31	26	18	15	15	20	30	40	43	34		12
20	50	43	47	29	18	12	17	18	33	40	47	45		12
ALL HRS	47	41	41	28	18	15	15	20	32	39	44	39	31	12
CEILING LESS THAN 1000 FEET AND/OR VISIBILITY LESS THAN 2 1/2 MI														
08	40	45	34	27	16	10	15	23	27	29	37	36		12
14	35	42	27	22	14	9	10	15	25	32	35	31		12
20	54	39	41	23	14	11	11	14	29	34	40	41		12
ALL HRS	43	35	33	24	15	10	12	17	27	32	37	35	27	12
CEILING LESS THAN 1000 FEET AND/OR VISIBILITY LESS THAN 2 1/2 MI														
08	14	12	13	8	6	3	3	3	8	12	16	12		12
14	9	10	12	7	5	2	3	2	5	11	12	8		12
20	16	9	16	9	4	3	2	5	8	13	12	12		12
ALL HRS	13	10	13	8	5	2	3	3	7	12	13	11	8	12
CEILING LESS THAN 600 FEET AND/OR VISIBILITY LESS THAN 1 1/4 MI														
08	8	7	7	6	1	0	1	1	6	9	10	8		12
14	4	5	6	5	2	1	1	1	2	5	5	5		12
20	8	6	7	3	2	1	1	2	3	7	7	7		12
ALL HRS	7	6	7	4	2	1	1	1	3	7	7	6	4	12
CEILING LESS THAN 100 FEET AND/OR VISIBILITY LESS THAN 1/2 MI														
08	3	4	4	2	1	0	0	1	2	2	4	4		12
14	1	2	4	0	1	1	0	0	1	1	1	3		12
20	3	1	3	1	1	1	0	1	0	2	2	2		12
ALL HRS	2	2	3	1	1	1	0	1	1	2	3	3	2	12

EAST LONDON, SOUTH AFRICA

PREPARED BY: NOCD ASHEVILLE STATION NAME: GEORGE, SOUTH AFRICA ELEVATION: 725 FEET WMO #: 68828
LOCATION: 33 58S 22 25E

	TEMPERATURE (F)					PRECIPITATION (INCHES)				RELATIVE HUMIDITY				SURFACE WIND (KTS)			MEAN CLOUD AMOUNT(TENTHS)		MEAN NUMBER OF DAYS WITH						
	MEANS			EXTREME										PREVAILING					PRECIPITATION				TEMPERATURE		
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	MEAN	MAXIMUM	MINIMUM	24-HR MAXIMUM	1400 LST	2000 LST	VARGS PRESSURE (INCHES OF MERCURY)	EEM DEW POINT (F)	DIRECTION	SPEED	MAX GUST	1400 LST	2000 LST	.01 OR MORE	SNOWFALL	THUNDERSTORMS	VISIBILITY (7 MI OR LESS)	90 OR ABOVE	32 OR BELOW	0 OR BELOW
JAN	76	58	67	101	47	2.9	7.2	0.8	5.4	69	87	5.6	60	SE	9		5	6	8	0	1	2		2	0
FEB	76	59	67	101	46	2.5	7.0	0.4	5.4	69	88	5.4	61	SE	8		5	6	7	0	1	2		2	0
MAR	74	57	66	101	44	3.1	11.1	0.7	4.5	70	92	5.3	60	SE	8		5	6	7	0	1	4		2	0
APR	71	54	62	101	39	2.5	10.8	0.4	5.4	72	90	48	56	W	8		5	6	7	0	1	3		1	0
MAY	67	49	58		28	2.5	7.3	0.6	5.5	80	96	58	53	NW	9		5	6	7	0	1	1		1	0
JUN	63	47	55	87	32	1.6	4.9	0.2	2.4	83	93	63	47	NW	7		4	5	5	0	0	2		0	4
JUL	63	45	54	87	34	1.8	5.4	0.1	2.8	86	93	62	47	NW	7		4	4	5	0	1	2		0	7
AUG	64	45	54	93	35	2.6	10.5	0.4	4.6	86	95	63	48	NW	8		5	5	7	0	0	2		1	7
SEP	67	47	57	100	36	2.6	9.6	0.5	5.2	82	87	66	50	W	9		5	6	8	0	0	2		1	3
OCT	68	50	59	101	38	3.0	7.4	0.6	3.5	69	90	63	53	W	9		5	6	10	0	1	2		1	1
NOV	73	54	63	101	40	2.8	7.8	0.2	3.8	68	88	63	56	SE	9		5	6	8	0	1	2		1	0
DEC	74	56	65	101	46	2.7	5.5	0.8	3.1	67	87	59	59	SE	9		5	6	8	0	1	2		1	0
ANN	71	52	61	101	32	30.4	43.2	19.7	5.5	74	90	64	54	W	9		5	5	91	0	10	25		12	28
EYR	36	31	31	31	31	30	30	30	30	27	27	24	30	30	30		20	20	30	14	24	31		30	21

LESS THAN 0.5 DAYS, 0.5 OR 0.05 INCH, OR 0.5 PERCENT AS APPLICABLE
THE VALUE LISTED UNDER PRESSURE ALTITUDE INDICATES THAT VALUE IS EXCEEDED ONLY 0.05 % OF THE TIME WHEN
LABELED 99.95% OTHERWISE IT IS THE MEAN
(YR IS EQUIVALENT YEARS OF RECORD (I.E. THE ACTUAL NUMBER OF YEARS UTILIZED IN THE CALCULATIONS.)

FLYING WEATHER, - PERCENT OF HOURS

HOURS (LST)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YRS
CEILING LESS THAN 1000 FEET AND/OR VISIBILITY LESS THAN 3 MI														
08	11	12	14	10	5	5	6	6	7	10	11	10		8
14	8	10	7	7	4	4	5	7	7	8	9	10		8
20	12	11	14	8	7	7	8	9	10	10	12	12		8
ALL HRS	10	11	12	8	6	5	6	7	8	9	11	11	9	8
CEILING LESS THAN 1500 FEET AND/OR VISIBILITY LESS THAN 3 MI														
08	7	8	10	7	4	3	4	4	5	8	7	7		8
14	4	5	4	4	3	2	3	4	4	4	4	4		8
20	6	7	7	4	4	4	5	6	5	6	7	7		8
ALL HRS	5	7	7	5	3	3	4	5	4	6	6	6	5	8
CEILING LESS THAN 5000 FEET AND/OR VISIBILITY LESS THAN 2 MI														
08	4	7	8	5	2	2	3	2	4	7	5	5		8
14	2	3	2	3	2	2	2	2	2	3	3	2		8
20	4	5	6	3	3	3	4	3	4	4	4	4		8
ALL HRS	3	5	5	4	2	2	3	2	3	5	4	4	4	8
CEILING LESS THAN 200 FEET AND/OR VISIBILITY LESS THAN 1/2 MI														
08	1	1	1	2	1	1	1	1	1	2	1	1		8
14	0	0	0	0	0	0	0	0	0	0	0	0		8
20	1	1	1	0	0	1	2	0	0	1	1	0		8
ALL HRS	1	1	1	1	0	1	1	0	0	1	1	0	1	8

GEORGE, SOUTH AFRICA

PREPARED BY: NOCD ASHEVILLE

STATION NAME: LUDERITZ BAY, NAMIBIA
LOCATION: 26 38S 15 06E

ELEVATION: 76 FEET

WMO #: 68300

	TEMPERATURE (F) MEANS			TEMPERATURE (F) EXTREME		PRECIPITATION (INCHES)				RELATIVE HUMIDITY		SURFACE WIND (KTS)			MEAN CLOUD AMOUNT (TENTHS)		MEAN NUMBER OF DAYS WITH PRECIPITATION			TEMPERATURE		
	MAXIMUM	MINIMUM		MAXIMUM	MINIMUM	MEAN	MAXIMUM	MINIMUM	24-HR MAXIMUM	0900 LST	1500 LST	DIRECTION	SPEED	MAX GUST	0900 LST	1500 LST	>= 0.01	SNOWFALL	THUNDERSTORMS	>= 87	<= 40
JAN	71	57		84	42					89	75										
FEB	69	58		82	41					91	67										
MAR	70	57		82	44					88	72										
APR	69	54		78	42					88	74										
MAY	65	52		81	38					85	75										
JUN	62	52		88	32					87	75										
JUL	64	50		86	37					78	70										
AUG	63	50		91	41					82	73										
SEP	63	51		87	38					87	76										
OCT	65	53		86	38					86	74										
NOV	67	54		85	41					86	73										
DEC	69	51		79	41					83	75										
ANN	67	54		88	32					85	74										
EYR	30	30		30	30					20	20		14								

LESS THAN 0.5 DAYS, 0.5 OR 0.05 INCH, OR 0.5 PERCENT AS APPLICABLE.

THE VALUE LISTED UNDER PRESSURE ALTITUDE INDICATES THAT VALUE IS EXCEEDED ONLY 0.05 % OF THE TIME WHEN LABELED 99.95% OTHERWISE IT IS THE MEAN

EYR IS EQUIVALENT YEARS OF RECORD (I.E. THE ACTUAL NUMBER OF YEARS UTILIZED IN THE CALCULATIONS.)

LUDERITZ BAY, NAMIBIA

PREPARED BY: NOCD ASHEVILLE

STATION NAME: MAPUTO, MOZAMBIQUE
LOCATION: 25 58S 32 36E

ELEVATION: 197 FEET

WMO #: 67339

	TEMPERATURE (F) MEANS			TEMPERATURE (F) EXTREME		PRECIPITATION (INCHES)				RELATIVE HUMIDITY		SURFACE WIND (KTS)			MEAN CLOUD AMOUNT (TENTHS)		MEAN NUMBER OF DAYS WITH PRECIPITATION			TEMPERATURE		
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	MEAN	MAXIMUM	MINIMUM	24-HR MAXIMUM	0900 LST	1500 LST	DIRECTION	SPEED	MAX GUST	0900 LST	1500 LST	>= 0.01	SNOWFALL	THUNDERSTORMS	>= 78	<= 32
JAN	81	71	76	108	62	5.1	20.6	0.0	5.3	73	64										
FEB	82	71	76	104	63	5.4	16.5	0.0	7.2	75	68										
MAR	84	70	76	105	59	4.1	22.1	0.1	5.0	75	67										
APR	84	67	75	103	57	2.3	14.0	0.0	6.4	75	66										
MAY	81	63	72	101	51	1.1	5.8	0.0	2.2	73	63										
JUN	77	59	68	94	45	0.3	3.8	0.0	1.8	72	60										
JUL	77	57	67	94	47	0.3	6.1	0.0	2.6	72	61										
AUG	78	59	69	100	48	0.6	4.8	0.0	3.1	70	62										
SEP	79	62	70	103	49	1.1	5.5	0.0	3.4	69	66										
OCT	81	65	73	111	57	2.3	7.4	0.0	2.8	70	70										
NOV	82	68	75	111	57	3.2	14.4	0.0	7.6	73	70										
DEC	85	70	78	112	59	3.7	9.8	0.4	3.4	73	69										
ANN	81	65	73	112	45	30.8	66.1	14.4	9.3	72	66										
EYR	30	30	30	30	30	30	30	30	30	20	20		30								

LESS THAN 0.5 DAYS, 0.5 OR 0.05 INCH, OR 0.5 PERCENT AS APPLICABLE.

THE VALUE LISTED UNDER PRESSURE ALTITUDE INDICATES THAT VALUE IS EXCEEDED ONLY 0.05 % OF THE TIME WHEN LABELED 99.95% OTHERWISE IT IS THE MEAN

EYR IS EQUIVALENT YEARS OF RECORD (I.E. THE ACTUAL NUMBER OF YEARS UTILIZED IN THE CALCULATIONS.)

MAPUTO, MOZAMBIQUE

PREPARED BY: NOCD ASHEVILLE STATION NAME: PORT ELIZABETH, SOUTH AFRICA ELEVATION: 197 FEET WMO #: 68842
LOCATION: 33 59S 25 36E

	TEMPERATURE (F)					PRECIPITATION (INCHES)						RELATIVE HUMIDITY				SURFACE WIND (MPH)			MEAN NUMBER OF DAYS WITH									
	MEANS			EXTREMI						SNOW ALL									PRECIPITATION					TEMPERATURE				
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	MEAN	MAXIMUM	MINIMUM	24-HR MAXIMUM	MEAN	MAXIMUM	24-HR MAXIMUM	0730 LST	1330 LST	VAPOR PRESSURE (INCHES OF MERCURY)	DEW POINT	PRESSURE ALTITUDE (FEET 1000 MB)	DIRECTION	SPEED	MAX 5/ST	MEAN SPEED (MPH)	.10 OR MORE	.50 OR MORE	SNOW ALL	THUNDERSTORMS	VISIBILITY REDUCED BY FOG	32 OR BELOW	32 OR BELOW	90 OR ABOVE	90 OR ABOVE
JAN	78	63	70	102	49	1.6	5.1	0.2	3.2				77	65	50	62					6	4	2	0	2	2	0	0	0	0
FEB	78	64	70	104	46	1.5	5.4	0.1	3.8				80	67	53	64					6	4	2	0	2	1	0	0	0	0
MAR	76	61	69	101	45	2.2	12.3	0.3	8.8				84	67	54	67					7	5	2	0	2	1	0	0	0	0
APR	74	57	66	102	40	2.2	5.8	0.3	4.1				84	65	48	59					6	4	2	0	2	1	0	0	0	0
MAY	71	51	61	96	31	2.7	6.4	0.1	4.0				83	63	44	54					6	4	2	0	2	1	0	0	0	13
JUN	68	47	58	90	33	2.4	8.8	0.3	7.0				82	56	38	49					6	4	2	0	2	1	0	0	0	20
JUL	67	47	57	93	33	2.1	8.5	0.3	3.8				83	57	34	49					6	4	2	0	2	1	0	0	0	20
AUG	67	48	58	98	32	3.0	7.2	0.4	5.3				83	63	38	49					6	4	2	0	2	1	0	0	0	18
SEP	68	51	60	103	35	2.8	18.4	0.5	16.6				81	65	39	52					7	5	2	0	2	1	0	0	0	10
OCT	69	54	62	104	37	2.3	7.4	0.8	4.1				78	68	43	55					7	5	2	0	2	1	0	0	0	2
NOV	72	57	65	104	42	1.9	4.8	0.4	2.8				76	66	43	56					7	5	2	0	2	1	0	0	0	1
DEC	75	60	68	99	44	1.8	5.8	0.4	4.1				74	65	45	60					6	4	2	0	2	1	0	0	0	1
ANN	72	55	64	104	31	26.1	42.3	16.1	16.6				80	64	45	56					78	54	24	0	24	12	0	0	0	85
EYR	48	48	48	48	48	48	48	48	48				48	48	29	29					12	12	12	0	12	12	12	12	12	12

LESS THAN 0.5 DAYS, 0.5 OR 0.05 INCH, OR 0.5 PERCENT AS APPLICABLE
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FLYING WEATHER, PERCENT OF HOURS

HOUR (LST)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YRS
CEILING LESS THAN 5000 FEET AND/OR VISIBILITY LESS THAN 6 MI														
08	37	35	38	36	28	24	31	34	33	37	34	34		12
14	25	24	20	17	15	12	14	13	18	19	17	16		12
20	38	31	30	25	17	16	17	22	28	30	33	28		12
ALL HRS	33	30	29	26	20	17	21	23	26	29	28	26	26	12
CEILING LESS THAN 3000 FEET AND/OR VISIBILITY LESS THAN 2 1/2 MI														
08	30	26	29	21	16	11	20	20	21	28	28	27		12
14	21	20	14	14	11	9	11	9	14	16	14	13		12
20	33	27	25	22	14	12	11	18	25	27	31	25		12
ALL HRS	28	24	23	19	14	11	15	16	21	24	24	22	20	12
CEILING LESS THAN 1000 FEET AND/OR VISIBILITY LESS THAN 2 1/2 MI														
08	8	6	11	6	7	7	10	10	9	9	8	6		12
14	4	3	5	5	4	2	3	3	3	5	4	4		12
20	7	7	7	4	5	2	4	5	6	6	5	5		12
ALL HRS	6	5	8	5	5	4	5	6	6	7	6	5	6	12
CEILING LESS THAN 650 FEET AND/OR VISIBILITY LESS THAN 1 1/4 MI														
08	4	4	6	4	2	1	4	4	4	6	5	4		12
14	2	2	4	2	2	1	1	1	2	3	3	1		12
20	4	1	5	2	2	1	1	2	4	4	3	2		12
ALL HRS	4	3	5	3	4	1	2	2	4	4	3	2	3	12
CEILING LESS THAN 300 FEET AND/OR VISIBILITY LESS THAN 1/2 MI														
08	1	2	2	3	1	1	3	3	1	2	2	1		12
14	1	0	1	1	1	0	0	0	0	1	1	0		12
20	2	1	2	1	1	1	1	1	0	1	1	1		12
ALL HRS	1	1	2	1	1	1	1	1	1	1	1	1	1	12

PORT ELIZABETH, SOUTH AFRICA

PREPARED BY: NOCD ASHEVILLE STATION NAME: PORT NOLLOTH, SOUTH AFRICA ELEVATION: 13 FEET WMO #: 68408
LOCATION: 29 14S 16 52E

	TEMPERATURE (F) MEANS MAXIMUM	MEANS MINIMUM	MEANS AVERAGE	EXTREME MAXIMUM	EXTREME MINIMUM	PRECIPITATION (INCHES) MEAN	MAXIMUM	MINIMUM	MAXIMUM 24 HR	RELATIVE HUMIDITY 0700 LST	1300 LST	MEAN PRESSURE AT STATION LEVEL	DEW POINT	SURFACE WINDS (MPH) PREVAIL DIRECTION	PREVAIL SPEED	ENDUR DIRECTION	ENDUR SPEED	MEAN CLOUD AMOUNT (TENTHS) 0900 LST	1400 LST	MEAN NUMBER OF DAYS WITH PRECIPITATION .01 OR MORE	SNOW ICE	THUNDERSTORMS	HIGH VISIBILITY (6.0 MI OR MORE)	LOW VISIBILITY (LESS THAN 0.5 MI)	TEMPERATURE 90 OR ABOVE	32 OR BELOW
JAN	67	54	61	104	41	0.0	0.5	0.0	0.5	72	40		56	SE	9	S	10	4	2	1	0	0	17	0	0	0
FEB	67	55	61	107	42	0.0	0.0	0.0	0.0	74	44		57	SE	9	S	9	3	2	1	0	0	18	0	0	0
MAR	67	54	60	104	40	0.2	1.5	0.0	1.5	77	51		56	SE	8	S	9	4	2	1	0	0	17	0	0	0
APR	66	51	59	97	31	0.2	1.1	0.0	1.1	81	60		54	ESE	8	S	9	4	4	1	0	0	15	0	1	0
MAY	65	49	57	94	29	0.4	1.1	0.0	0.8	86	70		51	ESE	8	SSE	8	4	4	1	0	0	11	0	1	0
JUN	65	47	56	96	31	0.3	1.1	0.0	0.9	83	76		48	E	8	SSE	8	4	4	1	0	0	7	0	3	1
JUL	64	46	55	95	31	0.4	2.0	0.0	0.8	84	76		48	E	8	S	9	4	4	1	0	0	7	0	4	1
AUG	64	46	55	104	31	0.3	1.4	0.0	1.4	86	78		48	NE	8	S	10	4	4	1	0	0	8	0	3	1
SEP	64	48	56	101	34	0.2	1.1	0.0	1.1	87	78		50	ESE	9	SSE	11	4	3	1	0	0	8	0	1	0
OCT	64	50	57	104	36	0.1	0.8	0.0	0.8	87	80		52	E	9	S	12	4	3	1	0	0	4	0	1	0
NOV	66	52	59	105	41	0.1	1.1	0.0	0.8	87	80		54	E	9	S	11	4	3	1	0	0	12	0	1	0
DEC	66	53	60	104	46	0.1	0.8	0.0	0.8	83	80		55	SE	9	S	11	4	3	1	0	0	15	0	0	0
ANN	65	50	58	107	31	2.3	2.0	0.0	1.5	82	69		52	SE	9	S	11	4	3	1	0	0	146	0	19	3
EYR	53	52	51	6	64	48	64+	64+	50	29	29		18	S	5	S	4	28	22	26	10	20	20	53	35	

LESS THAN 0.5 DAYS, 0.5 OR 0.05 INCH, OR 0.5 PERCENT AS APPLICABLE
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PORT NOLLOTH, SOUTH AFRICA

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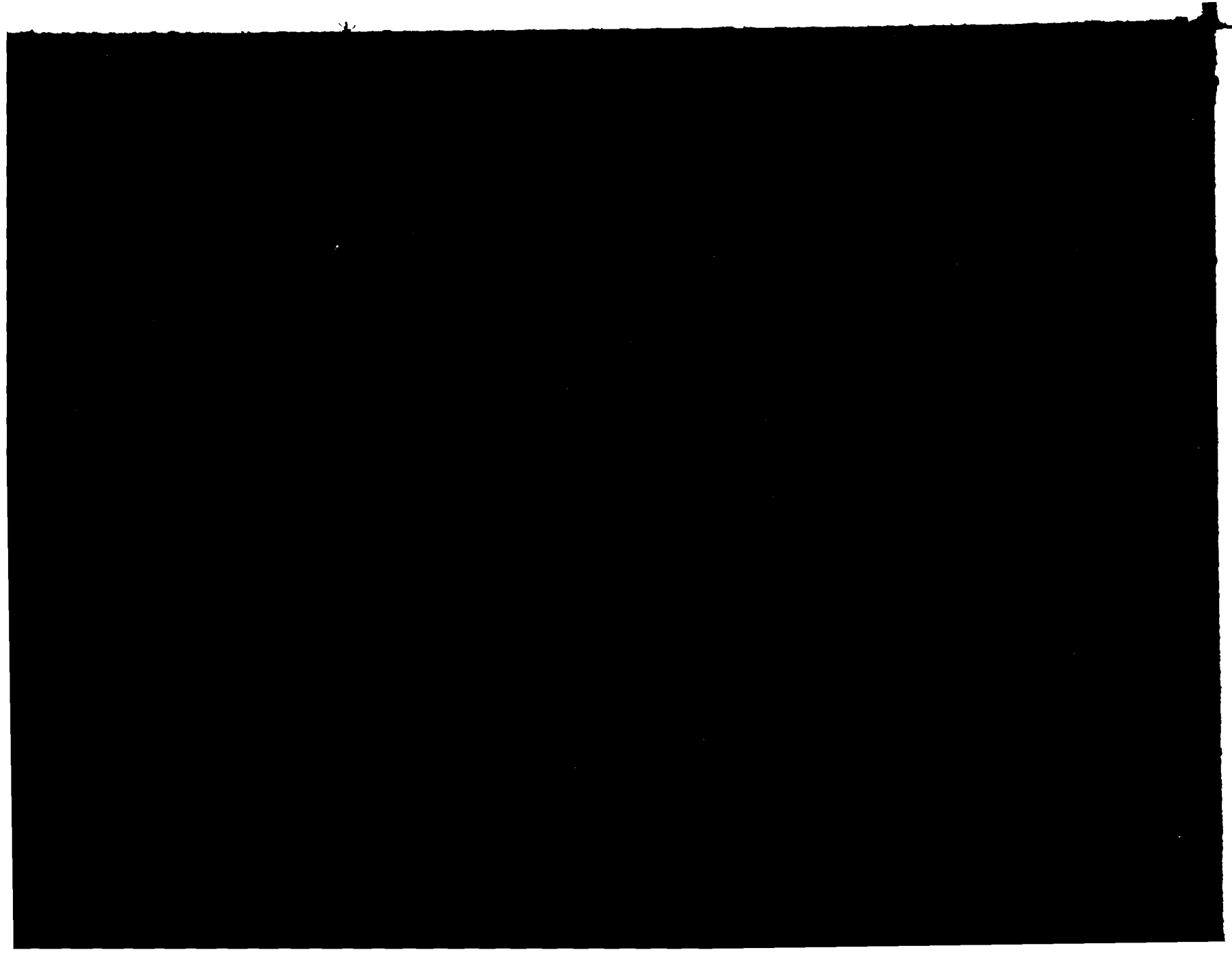

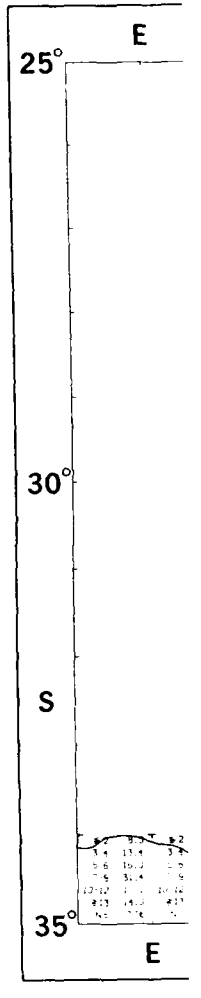
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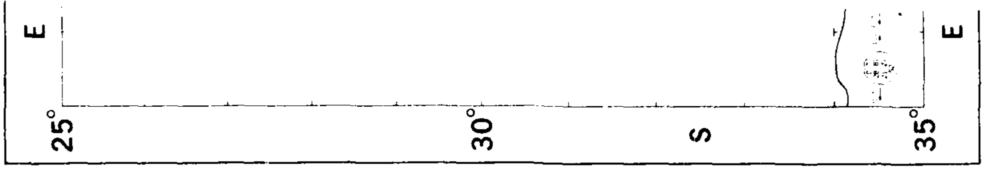
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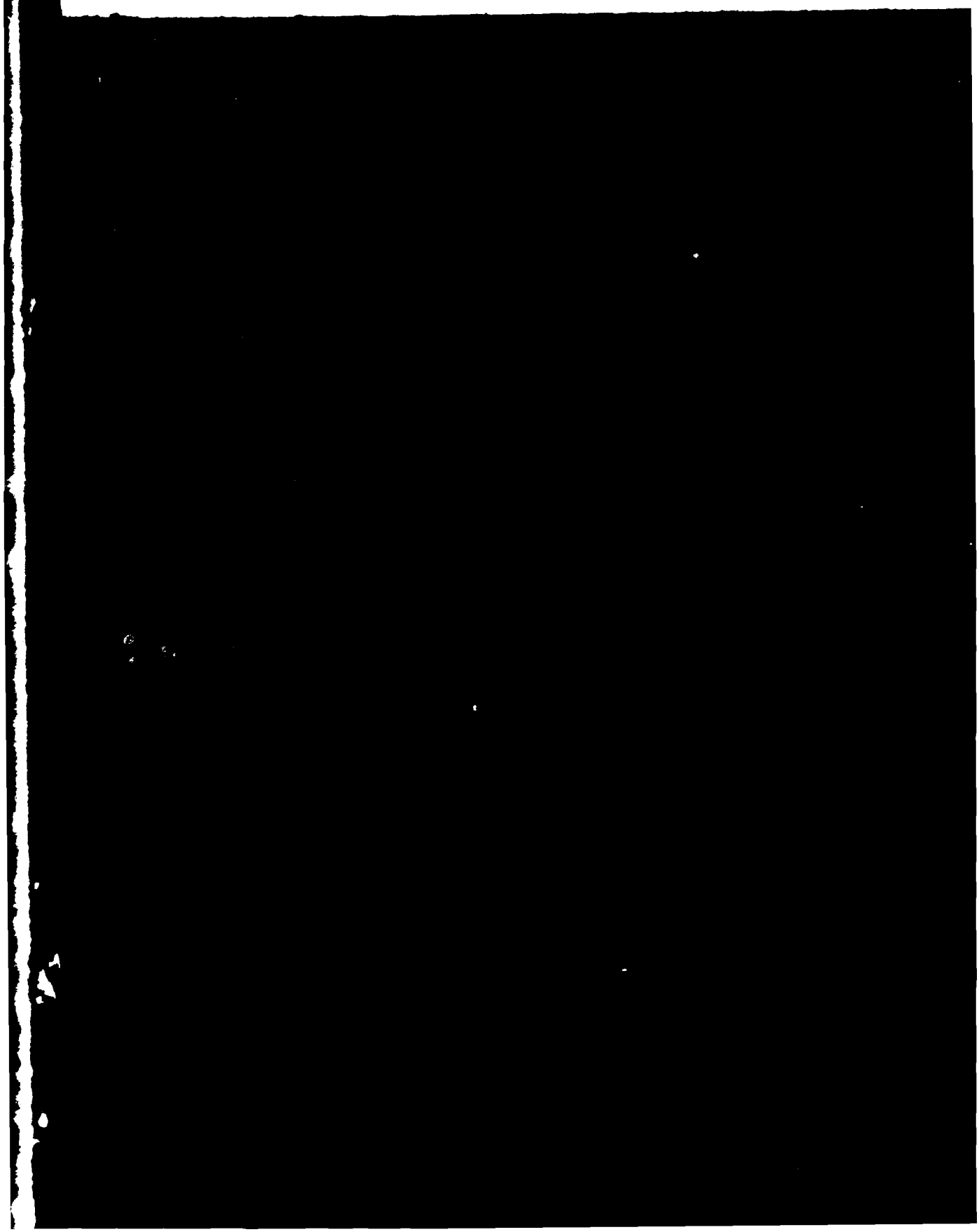

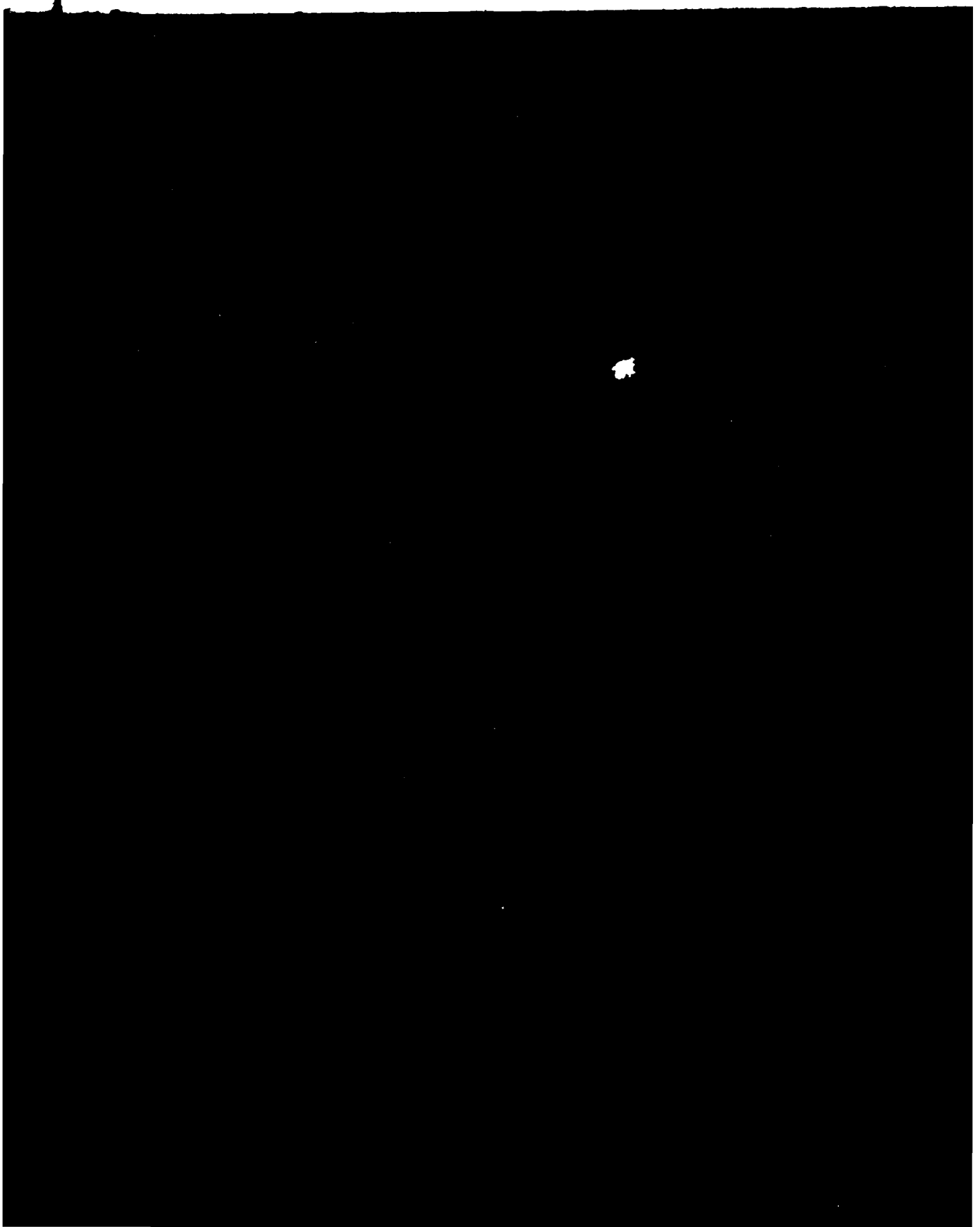

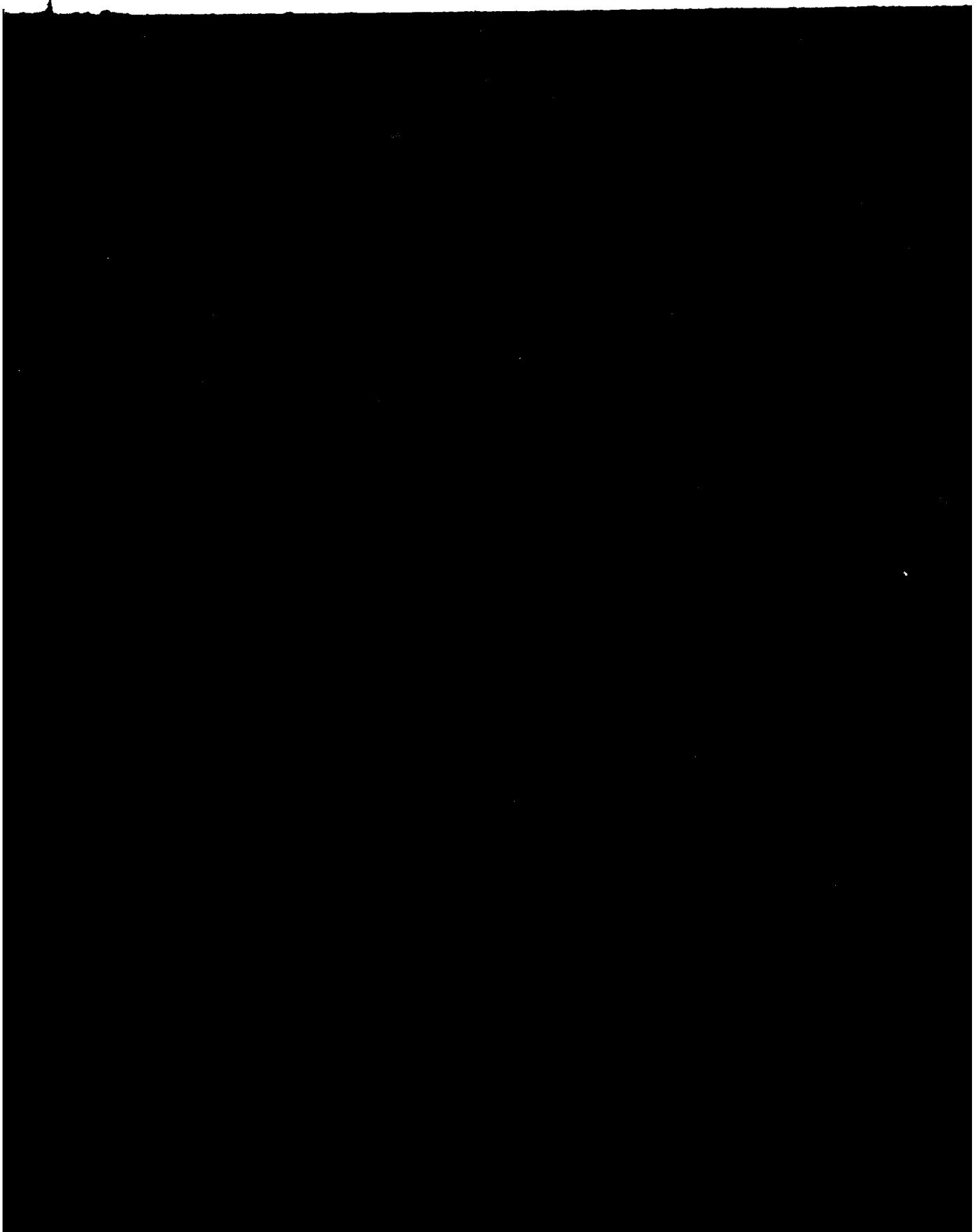

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